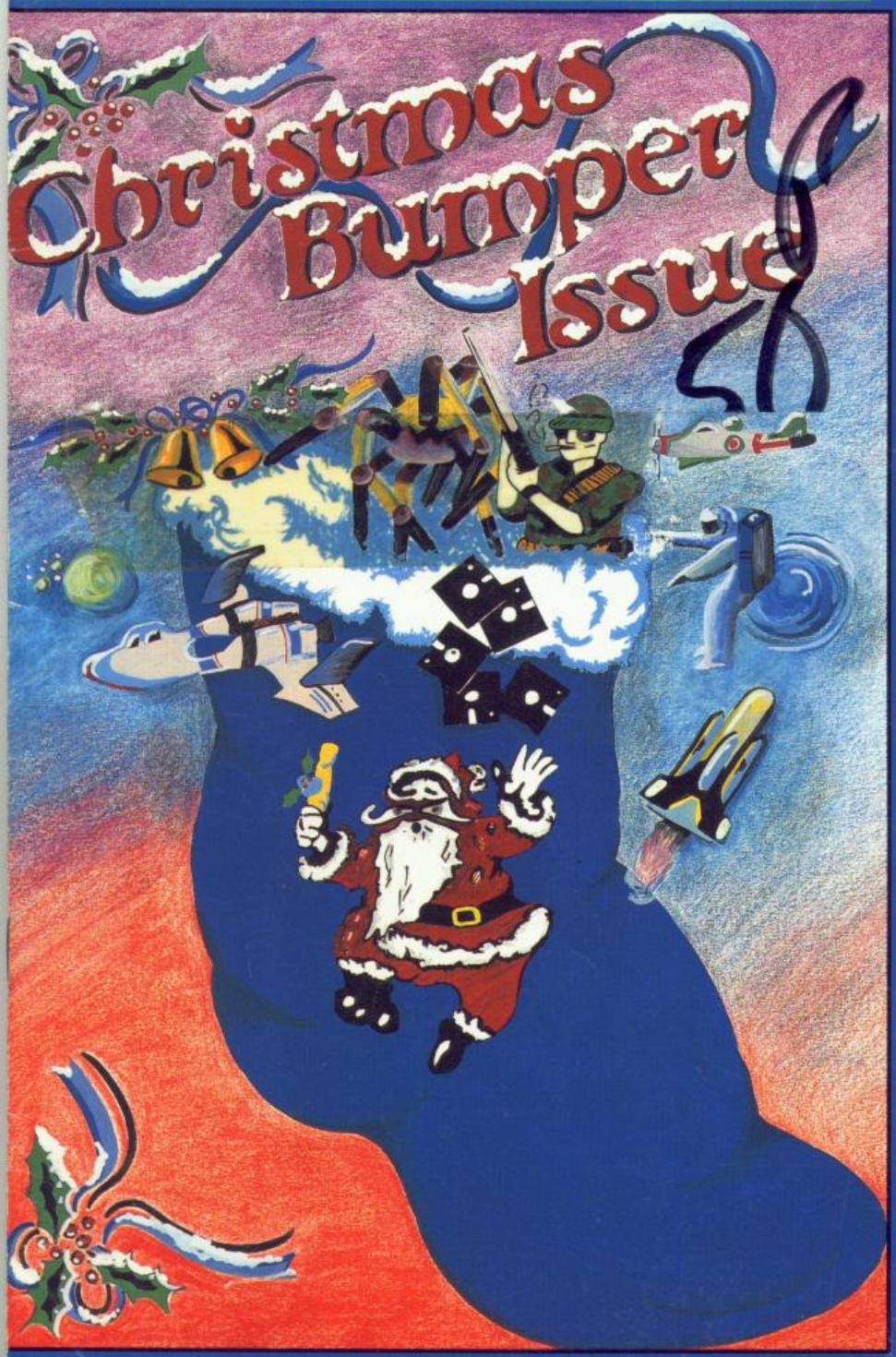
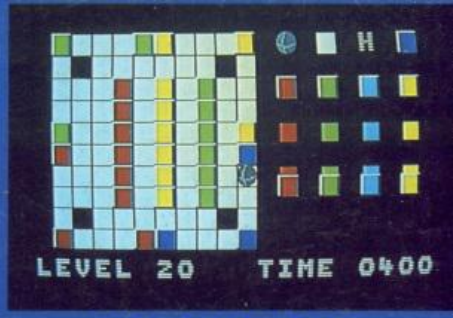
# COMMODORE Disk User

JANUARY/FEBRUARY 1989
£2.75

FOR C64 AND C128 USERS

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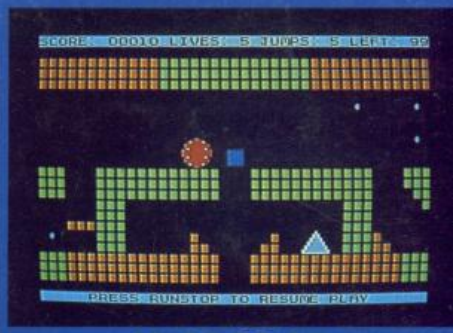


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Commodore Disk User
Volume 2 Number 2
January/February 1989

As you may have noticed, the cover price of *Commodore Disk User* has increased by 25p to £2.75. We regret the necessity for this – it is not of our making. The increase is due to the insistence of HM Customs & Excise that a section of CDU consists of Computer software and is therefore eligible for VAT. In spite of the increase, we think that you will still find *Commodore Disk User* to be excellent value for money, particularly since we are including extra software, both on this disk and the next issue.

## IN THE MAGAZINE

**Update** 4
Disk news

**Disk Instructions** 6
How to use your CDU disk

***Reviews*** 7
Latest disk games

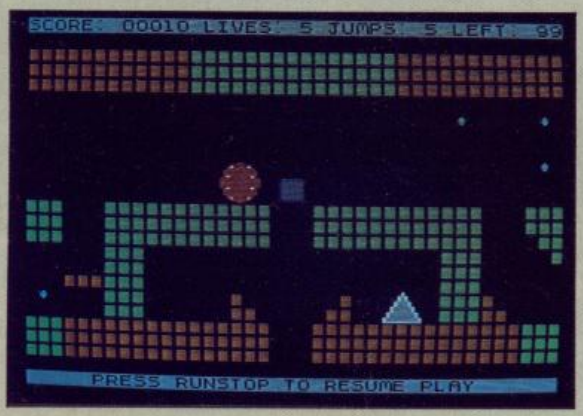
**FORTH** 29
More on last issue's language system

**Dungeons & Dragons** 31
The grandfather of roleplaying games hits the computer screen

**ZMON** 34
Continuing the Z80 monitor documentation

**Disk Dungeons** 36
The thoughts of Lord British – and more

**High-speed Graphics** 40
Getting into three dimensions




## ON THE DISK

**Disk Turbo** 13
Speed up your disk access

**Blastball** 14
A bat 'n ball extravaganza

**Colour Bind** 16
A sliding block problem with a difference

**Border Sprite** 18
Make use of those screen edges

**Data Maker** 19
The easy way to get machine code into Basic

**Life** 20
The bizarre world of cellular automata

**Menu Maker 128** 21
Make your 128 disks easy to use

**Microdot** 22
Save the world from radiation sickness

**Spots** 24
Can you beat the machine's dice rolls?

**Easy scroller** 26
Scrolling made simple

**Runaway** 28
Can you escape from a dreary domestic existence?

**Logic** 42
The puzzle that will have you tearing your hair out

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# Update

We keep you up to date with the latest Commodore news

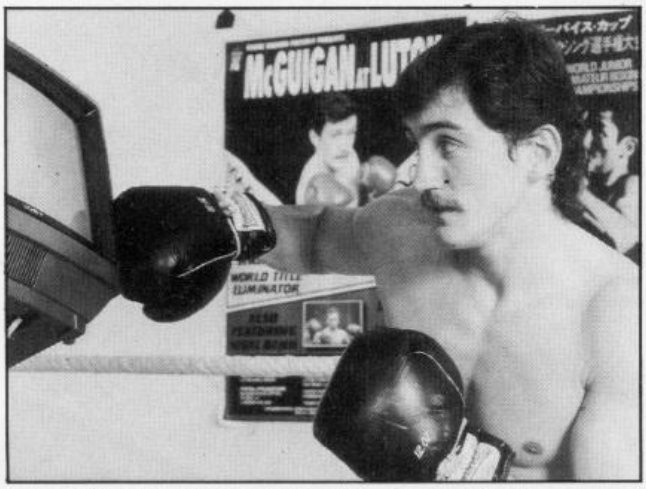
## Below the belt

When the going gets tough, the tough get gonads' seems to be the message behind Superior's latest game *By Fair Means or Foul.*

The game is a gritty boxing simulation which allows groin punches, kneeing, kicking and head buts when the ref looks away. Whether Barry McGuigan ought to be getting himself mixed up with such below the belt methods is questionable but as long as he only endorses the product and not the tactics, it's probably okay.

The depth of McGuigan's involvement with the game is not clear. Superior seem fond of dropping his name into their publicity but don't actually say what he thinks of the game. All that is sure is that players who succeed in becoming the game's World Champion can enter a competition to win boxing trophies, £200 and certificates signed by McGuigan.

*By Fair Means or Foul* is on the new Superior Software/Alligata label and the disk costs £11.95.




*Barry McGuigan gives a monitor some hands-on experiences.*

## Dastardly Disks

Alright, will the despicable bounders who are ripping off RPS please stop it? After shouting from the treetops about its lucrative deal, it seems RPS is a little upset to find that Commodore brand look-alike disks are being foisted onto the public.

According to Ivor Norkett, "initial tests show that these pirate disks are totally inferior in quality and performance." Well, he would say that, he's the UK business manager for RPS and who are we to doubt his word?

If you don't want to end up shelling out for inferior disks make sure that the Commodore box has the magic words 'Manufactured by RPS' emblazoned on it.

*Munster fun from Again Again*

## Munsters Again

Alternative Software's new full price label, Again Again, opens its catalogue with a TV cult conversion to the Commodore. The cult is The Munsters TV series which features the wacky adventures of a family of monsters and ghouls. Although the programme only ran to two series back in 1965, it has weathered well and is currently attracting a lot of attention on Channel 4.

Again Again's game features Herman and Lily with their son Eddie, niece Marilyn and Lily's father, Grandpa. Also featured are the dragon that lives under the stairs and the dragster hearse which constitutes the family car.

Marilyn is the only normal member of the family but is considered to be ugly by Herman and Lily who feel protective towards the unfortunate girl. In the game, Marilyn has been kidnapped and the player has to guide Lily around the house and neigbbouring graveyard to find and wake Herman. The player then controls Herman and the hunt for the villain's chateau is on.

## Commodore Cleanup

It's amazing how much grease and dust collects on computer equipment. Everything seems to generate static and that's what attracts the dirt.

Accodata have a cleaning kit which not only provides suitable solutions for wiping away the surface dirt but also cleans the drive heads. The kit comprises a drive head cleaning disk and fluid, screen wipes, casing cleaner, and a selection of wipes and buds for getting into all those important little places. Each Accodata 5.25-inch Cleaning Kit costs £15.96 plus VAT.

## Pill Poppin' Pac-Mania

**Pac-Maniacs will be gobbling their power pills again in grandSlam's follow-up to *Pac-Land. Pac-Mania*, programmed by Teque, is a 3-D maze game which is a faithful conversion of this arcade favourite. Teque, who also created *Terramex* for the GrandSlam, have developed a new technique for downloading characters from the original arcade machine ROM to ensure that the characters are as close to the original as possible.**

***Pac-Mania* reverts to the maze of the earlier *Pac-Man* but Pac has learned to jump over ghosts when he gets into a tight spot. Despite this, the ghosts seem to have recruited fresh characters to take some of the spring from Pac's step – Blinky, Pinky, Inky and Clyde are joined by Sue and Jumpy in this multilevel game.**

***Pac-Mania* on C64 disk costs £14.95.**

## Dungeon Aid

*Dungeon Masters Assistant, Vol I: Encounters,* implies that SSI intends to set up a library of utilities for the *Advanced Dungeons and Dragons* connoisseurs. This, the first in a current series of one, deals with the villains who beset unwary travellers through AD&D lands.

Designed for use with TSR's games, *Encounter* has a database of over 1000 encounters and more than 1300 monsters and characters including all those from AD&D Monster Manuals I and II. If anyone feels that this is not sufficient and they'd like to have a Cookie Monster laying waste their valiant crews, the database is expandable according to the Dungeon Master's needs.

From my experience of AD&D sessions, most Dungeon Masters will cringe at the thought of allowing such number crunching to be handled by a mere computer


*Make war not love with Tank Attack*

## Chart Attack

It's taken CDS two years to come up with a sequel to the board/computer game *Brian Clough's Football Fortunes,* but *Tank Attack* is ready at last. No this isn't a football simulation, it's a wargame for non-wargamers.

The board is a map of the war-torn boundaries between four fictitious countries. Tanks and armoured cars form the pieces on the board and these are positioned by each of up to four players and moved by them according to movement allocations decided by the computer. Battles may be engaged in and the computer again decides the outcome.

This is no heavy wargame but a light entertainment which has more to do with the boardgame *Risk!* than it has to do with *Campaign.* It should therefore be able to command mass appeal because there are no difficult rules to master.

*The joystick that defies gravity?*

## Valley Interesting

**Welsh firm, Konix, seems to be falling over itself to flood the market with joysticks. After announcing the Navigator pistol grip sticks, news is out about two desktops, the Predator and the Megablaster. Add to this the rumblings of a new games machine and it's not hard to imagine that Konix may be sitting on a goldmine.**

**News of the games machine is very sketchy at the moment but, even if the rumours are only half true, it should send Sega and Nintendo reeling. According to reports, the new product is a development of the Flare machine which was talked about but never seen.**

**The big question surrounds the central processor. Is it a 68000? Is transputer technology involved? Does it make a good cup of tea? Can it cure cancer? Was it wafted here from Paradise? Is it pretty? Is it married? The questions and the mystique seem endless.**

**All that is 100 per cent sure is that something's cooking in the Konix kitchen but first sitting won't be until later in the year.**

## Moving House

Mediagenic, the software house with a split personality, has moved from the I'm-not-a-yuppie-I'm-just-very-very-rich atmosphere of Hampstead to the street cred technojungle of Reading. The move enables the Software Studios programming team to join the rest of the company in new hi-tech surroundings.

We do wish they would get their act together about the name. One minute we get press releases headed Mediagenic, the next it's back to the old Activision paper. Is there some sort of confusion or have they got stacks of old headed notepaper to use up?

The new address, to avoid total confusion, is Activision/Mediagenic, Blake House, Manor Farm Road, Reading, Berks (maybe so?) RG2 0JN and the phone number is (0734) 311666.

# Christmas Greetings

This CDU is special in a fit of seasonal generosity, we're offering you a double-sided program with twice the programs – and twice the value

Welcome to the Bumper Xmas *Commodore Disk User*. Overcome by the festive spirit, and seized with gratitude towards you, loyal readers, we've doubled up the number of programs on this issue's disk. We've done this by turning the disk into a 'flippy'. Each side of the disk now contains a menu with a selection of programs. To use the 'B-side' just flip the disk over and follow the usual instructions.

It being Xmas, we've packed our first flippy with extra games to fill in that long, bloated Yuletide afternoon – at last, an alternative to Billy Smart's Circus. Those who are not hugely games-oriented shouldn't despair. First of all, you'll find our usual range of utilities on this disk. Second, the next issue of *CDU* (March/April) will also be a bumper double-sided issue, but this time with the emphasis on utility programs. In the mean time, enjoy, and we hope that you have a user-friendly Christmas, and a bug-free New Year.

## Disk instructions

We have done our best to make sure that Commodore Disk User will be compatible with all versions of the C64 and C128 computers

Getting the programs up and running should not present you with any difficulties, simply put your disk in the drive and enter the command:

LOAD "MENU",8,1

Once the disk menu has loaded you will be able to start any of the programs simply by pressing the letter that is to the left of the program you want.

C128 users please note that you should be in C64 mode when using the disk. You can enter C64 mode by either:

i) Holding down the Commodore key (bottom left of the keyboard) when turning the computer on or,

ii) After turning the computer on type GO64 and answer "Y" when prompted "ARE YOU SURE?".

IT is possible for some programs to alter the computer's memory so that you will not be able to LOAD programs from the menu correctly until you reset the machine. We therefore suggest that you turn your computer off and then on before loading each program.

## How to copy CDU files

You are welcome to make as many of your own copies of Commodore Disk User programs as you want, as long as you do not pass them on to other people, or worse, even sell them for a profit.

For people who want to make legitimate copies, we have provided a simple machine-code file copier. To use it, simply select the item FILE COPIER from the main menu. The copier works with a single drive, is controlled by means of the function keys as follows:

F1: Copy file – the program will prompt you for a filename

F3: Resave the memory buffer – you may get an error on a save (perhaps you left the drive door open). Use this to try again.

F5: Disk commands – allows you to enter any regular C64 disk command

F7: Displays the directory

F2: Exits the program and returns you to Basic.

## Disk Failure

If for any reason the disk with your copy of Disk User will not work on your system then please carefully re-read the operating instructions in the magazine.

If you still experience problems then:

1) If you are a subscriber, return it to:
INFONET LTD
5 River Park Estate
Berkhampstead
Herts. HP4 1HL

2) If you bought it from a newsagents, return it to:
CDU Replacements
Direct Disk Supplies
Unit 19
Teddington Business Park
Station Road
Teddington
Middx TW11 9BQ
Telephone: 01 977-8777

Within eight weeks of publication date disks are replaced free.

After eight weeks a replacement disk can be supplied from DDS for a service charge of £1.00. Return the faulty disk with a cheque or Postal Order made out to DDS for £1.00 and clearly state the issue of CDU that you require. No documentation will be provided.

Please use appropriate packaging, cardboard stiffener at least, when returning a disk. Do not send back your magazine – only the disk please.

# Back Issues

Back Issues of Commodore Disk User are available at £3.00 per issue, via:

Infonet Ltd.
5 River Park Estate
Berkhampsted
Herts HP4 1HL

At the time of going to press, all issues of *Commodore Disk User* are available as back issues, with the exception of Issue 1, which we are hoping to reprint. Those magazines available are:

**Jan/Feb 1988:** Utilities – Disk Librarian, Disk Mate, Text Cracker, Noluxe Paint, C128 Ram disk. Games – Five-up, Quad plus Micronet demos.

**March/April 1988:** Utilities – Basic Compiler, Extended Basic, Crunch & Link, Psymon, Disk Librarian II, C128 Autoboot. Games – Supertact, Chaos in Space.

**May/June 1988:** Utilities – DrumSynth, Basic tokeniser, C-CAD, Basic compactor, C128 Windows. Games – Santolus, Atlantis

**July/August 1988:** Utilities – Disk Toolkit, Relocator, Orrery, Message Construction Kit. Games – Mind Games, 3D Breakout, Peggy 128

**September/October 1988:** Utilities – Fractal Frolics, Location Finder, Score Keeper, Colour Match, C128 Spreadsheet. Games – Scorpion, Escape, Starburst, Addit

**November/December 1988:** Utilities – CDU FORTH, Texted, Extractor, Windows 64, ZMON 128. Games – Oblivion, Cribbage Master.

# Reviews

## Vindicator

Can one man save the world? You bet he can otherwise you wouldn't be sitting there reading this waffle. The man in question is known as the Vindicator and the story that got him into this predicament is about as likely as that for any budding superhero, i.e. the merest smidgin above total improbability.

Earth has been wiped out by an invading race from some distant star system. All that are left now are a few pockets of resistance one of which contains you know who. It is all beginning to sound a bit like a Galactic Asterix isn't it?

Anyway, back to the plot. Who would believe that these all conquering aliens, having crossed light years of the space time continuum and destroyed everything that the Americans, Russians and our own Dad's Army could throw at them would leave themselves open to entire destruction by a single man? That's right, the Vindicator would. It seems that the qualifications for all incipient superheroes is to have an IQ somewhat lower than your body weight in kilograms.

As ordinary superheroes are somewhat run of the mill at the moment, it is necessary to perform not one but three amazing feats in order to make yourself stand out from crowd. Task number one involves the total destruction of the enemy complex.

Taking it as read that you have managed to infiltrate the enemy's lair, you now have to work your way through four levels of mazes looking for the computer rooms. Then, provided that you have the requisite pass, you can attempt to solve an anagram which will in turn give you two portions of a map, one showing your current location, the other where a bomb is situated. The anagrams are not the sort of things that the average crossword buff or Scrabble fan will solve instantly, but refer instead to people associated with the game. A sneaky look at the names on the high score table and in the packaging might help you here.

Naturally, there are plenty of hazards to keep you on your toes. Slow, lumbering, green monsters and a somewhat more lethal red variety take every opportunity to shoot. Avoiding them is not enough as you need to kill them in order to be able to steal their ammo, lift and computer passes. You will also need to find supplies of oxy-gum to keep your strength up - die and you lose everything that you have picked up.


Once the complex is blown, you naturally steal a plane and bomb everything in sight. Unfortunately, there is nowhere to land at the other end so you have to return and make the sam journey in a jeep, hopefully making good use of the clear spaces that you have bombed for yourself. Only robot tanks, helicopters and a final encounter with a mutoid guardian can stop you from reaching the catacombs.

Superhero-dom is almost beckoning now. More and more mutant hordes as you descend into the bowels of the Earth towards Hell itself and one final shoot out with the evil Gog himself. And the cynics said it couldn't be done!

If this review sounds somewhat cynical, then it is meant in the nicest possible way as this is one of the few games where I have enjoyed playing the sequel more than the original (Green Beret). Graphics, sound and gameplay are all crisp and if I have one complaint, it is that there is no way of practising each of the sections independently. Apart from that, there is plenty for the arcade fan to get his teeth into.

**GH**

### At a glance

**Title:** The Vindicator
**Supplier:** Imagine, 6 Central Street, Manchester M2 5NS.
**Price:** £9.95
**Graphics:** Uncluttered, well drawn
**Sounds:** The usual relentless tune
**Playability:** Sensible controls, easy to get into
**Value:** Lots of action for your money

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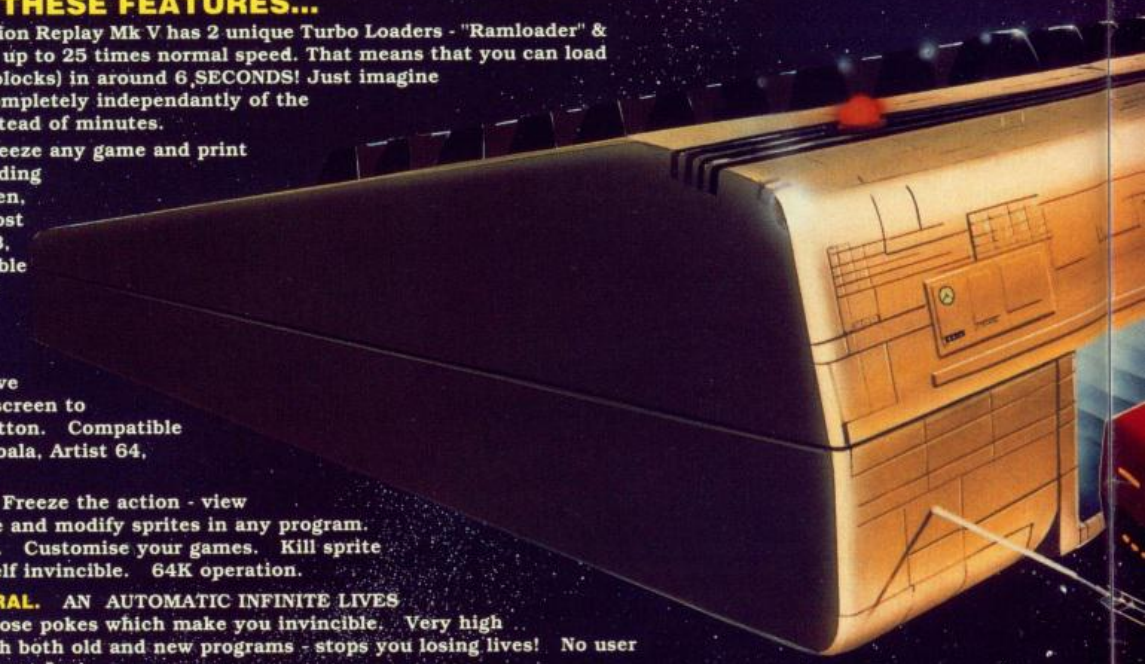

● **TURBO RELOAD.** Action Replay Mk V has 2 unique Turbo Loaders - "Ramloader" & "Warp 25". Both work at up to 25 times normal speed. That means that you can load a typical program (200 blocks) in around 6 SECONDS! Just imagine your backups loading completely independantly of the cartridge in seconds instead of minutes.

● **PRINTER DUMP.** Freeze any game and print out the screen. Eg. loading picture, high score screen, etc. Works with most printers. MPS 801, 803, Star, Epson, etc. Double size, 16 shades, reverse print option. Very versatile - no user knowledge required.

● **PICTURE SAVE.** Save any Hires multi colour screen to disk at the push of a button. Compatible with Blazing Paddles, Koala, Artist 64, Image System, etc.

● **SPRITE CONTROL.** Freeze the action - view animations. Load, save and modify sprites in any program. Flip, reverse, delete etc. Customise your games. Kill sprite collisions - make yourself invincible. 64K operation.

● **POKEFINDER GENERAL.** AN AUTOMATIC INFINITE LIVES GENERATOR! Finds those pokes which make you invincible. Very high success rate - works with both old and new programs - stops you losing lives! No user knowledge required. Great fun!

● **MULTISTAGE TRANSFER.** Even transfers multistage programs from tape to disk. The extra parts fast load - a unique feature. Enhancement diskis required for multi-loaders (see below).

● **SUPER COMPACTOR.** Ultra efficient program compaction techniques. Each program saved as a single file. 3 programs per disk side - 6 programs per disk, if you use both sides.

● **TEXT SCREEN EDITOR.** Modify the text screen on a frozen program. Customise your games by adding your name to the title screen - change colours, etc., then make a backup. Also a great programmers aid.

Verify, relocated save. Fast format - 12 seconds. Built in file copy - works with long files. Built in 1541 disk copy - 1 or 2 drives. Read directory, send disk commands. Change disk name, device number. Load direct - no need type filename.

● **SUPERFAST DISK OPERATION.** Load 200 blocks in just SIX SECONDS. Works with any program of any length. Works with multiload programs. Versatile - Backups, Basic, Monitor. Works with all drives including 1581. Use both sides of disk (1571). Standard format - no file conversion required. Superfast Save,

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**WHAT THE REVIEWERS SAID**

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**Commodore Disk User**

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- **FULLY INTEGRATED OPERATION.** The MK V 'Professional' has an onboard custom LSI LOGIC PROCESSING CHIP that integrates the whole range of utilities and makes them available at the press of a button at any time.
- **CENTRONICS INTERFACE.** For parallel printers, eg Epson, Star, prints listings with graphic characters. Send escape codes - make full use of your printer's extra facilities. Auto detect of parallel printer - no special commands required.
- **PROFESSIONAL MACHINE CODE MONITOR.** Full 64k monitor available at all times. Examine all memory, registers, IO, stack of any frozen program. Full range of commands, plus the luxuries that only a high capacity RAM/ROM system can offer: Assemble, disassemble, Hex/Ascii. Interpret in Ascii or screen codes. Fill, Hunt, Compare, Transfer memory. Number conversion, Register, Go. Load, Save, Verify (turbo, tape or disk). Two way scrolling of all screen displays. Output to printer (CBM or Centronics). Directory, error channel, 2 drive operation. Disk Monitor - read block, write block, assemble/disassemble drive memory etc. Hex calculator - add, subtract, multiply, divide. Unique set break/set freeze system. JSR Freeze. Full "floating" operation - corrupts no memory. Call Monitor from Basic or Freezer. Call Freezer from any point in your program.

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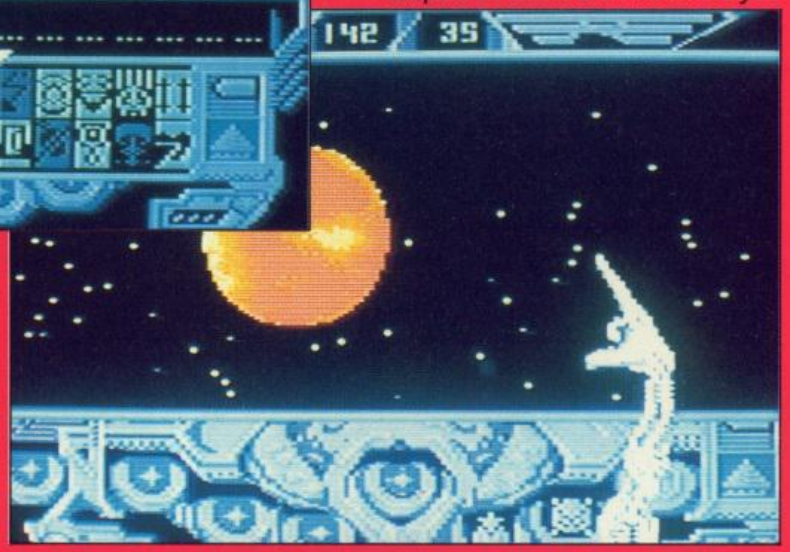
## Captain Blood

Captain Blood was in big trouble. He was formerly known to his friends as the games programmer Bob Morlock, desperate for money after his last 35p royalty cheque. He was so desperate that he programmed his alter ego, Captain Blood, into a massive ship called the Ark and disappeared as he pressed RUN only to reappear somewhere near Andromeda. Then the aliens attacked. As he leapt into hyperspace things really got bad as he split into 30 clones that were spread throughout the galaxy.


Without these clones Captain Blood will lose bodily fluids which he desperately needs and will soon die if they are not recovered. As the game begins, there are still five left somewhere out there and times is running out.

The Galaxy is a big place. In this case big means more than 32, 000 planets that may contain one of the five clones. Visiting every single planet is out of the question as you can see from the hand that you move around the screen he's getting in a bad way. The only way you have any hope of surviving this ordeal is to find some aliens that may want to help you.

Luckily, the planet that you begin the game orbiting around always contains a helpful alien to get you going but you have to find the alien before you can talk to him. To find an alien you must fly down the deepest canyon on the planet while avoiding the missile defences. When the game was first released on the Atari ST this was one of the best parts of the game. However, the humble C64 can't match the ST's graphic capabilities and so on the C64 this section is slow and tedious. Unfortunately, you have to go through it every time you visit a planet. Finally, when you reach the end of the canyon the appalling wire frame display disappears and the alien appears.

Learning to grunt and sqwark with the aliens is what this game is all about. It's all done by using the scrolling list of icons at the bottom of the screen. Clicking on these constructs a sentence. You can send this by clicking on the mouth icon when it's not moving, because the alien is talking to you when it is. How complex you can make these conversations depends on our skill in constructing sentences and the intelligence of the alien. Some haven't progressed much further than FOOD and KILL but others hate their enemies enough to deal with you. To get information from these in the form of the galactic co-ordinates of inhabited planets, you agree to blow up their enemies' home world.

By now your word is as strong as your arm and so you visit the enemy world to see what they will offer and continue to play one against the other until you find some new leads. As the game proceeds you teleport aliens on board your ship (and store them in the refridgarium) to take them home, destroy whole planets and run the gauntlet of missile systems to find a lead that will allow you to track down one of the remaining clones. Eventually you teleport on board the Ark where you can absorb the clone's fluids and survive a little longer.

Captain Blood was one of the most original games around. Much, however, has been lost in the translation from the Atari ST, such as the flying sequence, and the jump into hyperspace. The game that remains is good but not that good.

**Tony Hetherington**

### At a glance

**Title:** Captain Blood.
**Supplier:** Infogrames, Mitic House, Abbey Rd, Enfield Middx, EN1 2RQ.
**Price:** £14.95
**Graphics:** Interesting aliens.
**Sound:** Not too memorable.
**Playability:** Strategy part good, arcade section awful.
**Addictiveness:** Not a lot.

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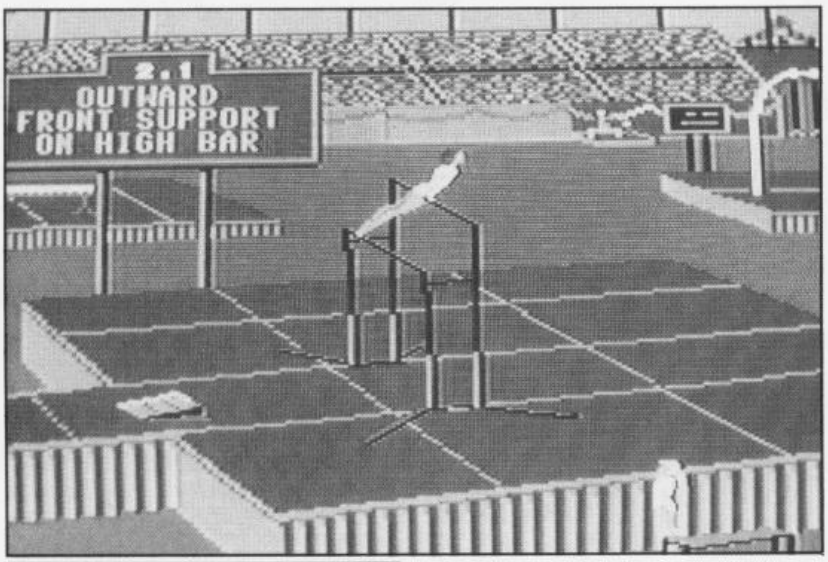



## The Games: Summer Edition

The Seoul Olympics are now little more than a distant memory of drugs scandals, Korean boxer sit-ins and someone called Flo-jo. Which is why I still can't fathom Epyx's decision to launch *The Games: Summer Edition* in the winter. I know it makes some sort of sense the Winter Edition appeared in the Summer, but it means they *have* missed the boat.

The package might be packed full with eight new gripping Olympic events, but their mass appeal and the fact that the US Olympic team helped to design it would have worked well in August or September. In December, however, the game must stand on its own. Luckily, it is one of the best of the *Games* series of games.

Epyx unfortunately, chose this one to launch a new front end with scenes of Seoul introducing the game. The action has now quite literally entered a new dimension as the old side-on displays are now rendered in 3D with inserts showing close-ups of the key displays. For example, in the Velodrome Cycling event (that curious sport where the competitors crawl around the track for two laps before sprinting for the finish) the screen is split into three areas including a top-down view of the track that shows the rider's position. Two 3D inserts show each bike.

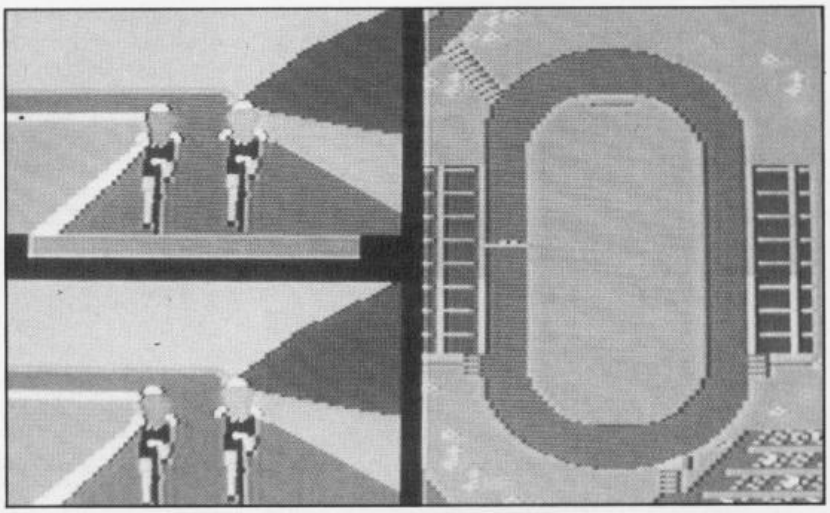
Once again, up to eight players can represent any of 24 nations at the games and compete in a series of track, field and gymnastic events as well as other sports such as archery and diving. The key to this curious mix is that the US Olympic team helped in the design of the game and so the events they have selected are either the ones they are, or were, good at.

On the track you have only one challenge – the 110-metre hurdles – as you attempt to mimic the achievements of Ed Moses. Here you need speed and co-ordination to take the hurdles in your stride and to win the gold.

The field events will perhaps bring more success as you must at least equal the Americans' recent efforts in both the Pole Vault and the hammer throw. The same is true of the gymnastic events on the rings and the uneven bars. I would say that these were the hardest events as they require you to preplan your program and use skill and timing to perform it. The judges are very strict – they actually deducted points for what I thought was a beautifully executed "plummet to the ground" movement.

The best hope of a gold and a world record for the US – and possibly for you as well – is the high board diving where you can aim for the marks and not the injuries incurred by US diver Greg Lukargis. You can perform either forward or reverse dives and pack in as many twists, pikes and turns in the space between the diving board and the water. Complete the dive without a splash and the panel of judges will be reaching for those tens.

The 3D graphics do add a lot to the tried and tested games formula and produce what many would call the best *Games* yet. The launch timing, though, is way out and the sales and chart position are sure to reflect this. Nevertheless, there will be a core of joystick athletes who would buy it even in the summer. **Tony Hetherington**



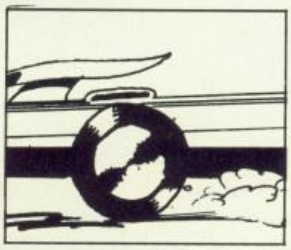
### At a glance

**Title:** The Games: Summer Edition
**Supplier:** Epyx/US Gold,
**Price:** £19.95
**Graphics:** Some very good 3D displays.
**Sound:** Anthems and cheers
**Playability:** waggling couldn't be easier.
**Addictiveness:** Go for gold, well maybe next time.

# Disk Turbo

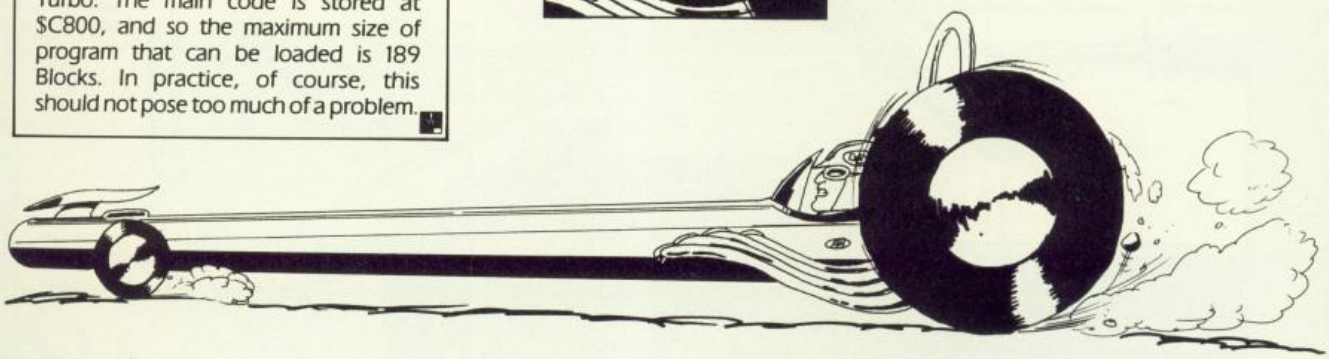
Speed up your disk access

**By Dave Taylor**



Disk Turbo, once installed, should speed up your disk saves and loads by a factor of around ten times. The program is installed by entering LOAD "DISK TURBO",8 and then RUN. It then displays a disk directory and the message "TURBO NOW ON".

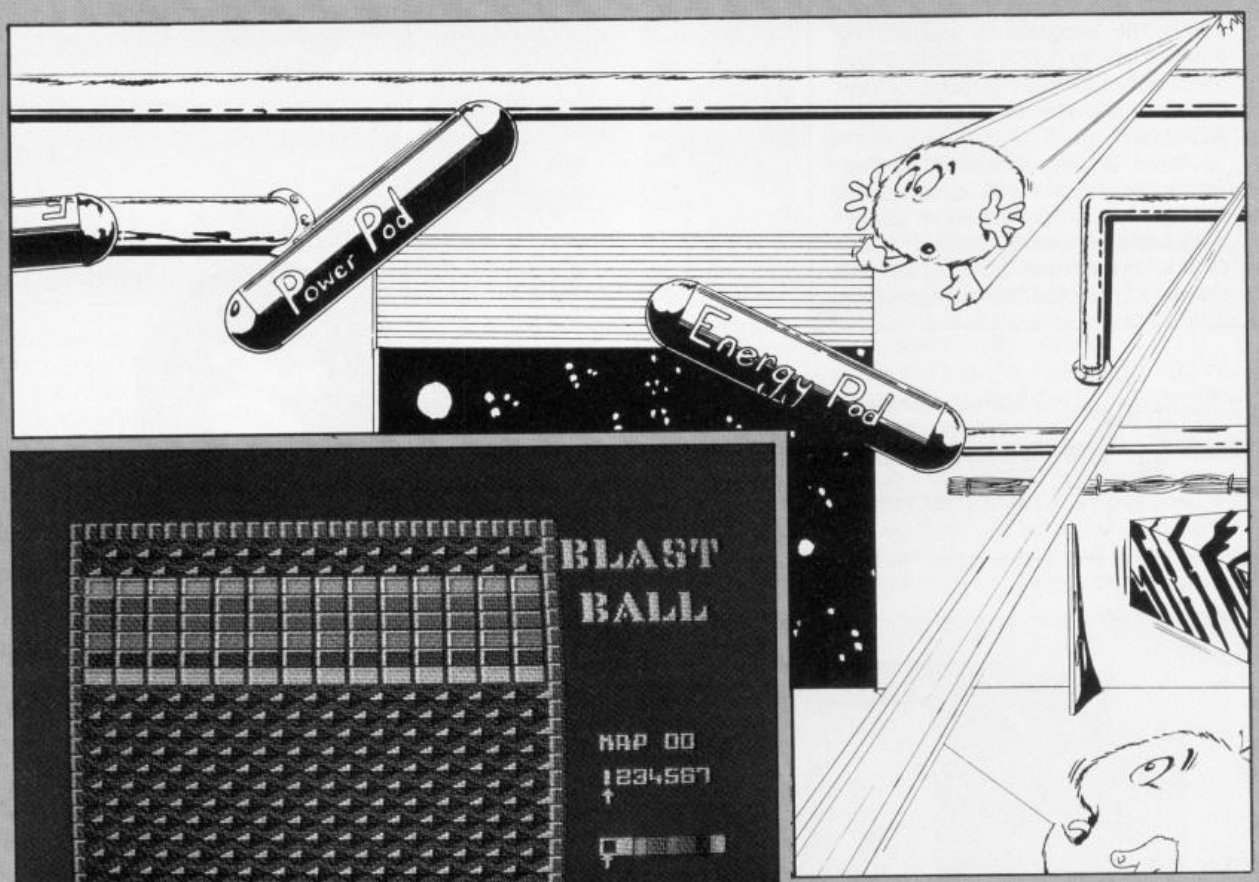
There is one limitation to Disk Turbo. The main code is stored at $C800, and so the maximum size of program that can be loaded is 189 Blocks. In practice, of course, this should not pose too much of a problem.



# Blastball

Break on through to the other side with this fast action game. It even comes complete with its own construction kit.

**By S. Patrick and S Maloney**




While scouting one day in your SSSI spacecraft you came across an enemy mothership from the 4th Dimension. Without warning a tractor beam sucks you into its lower cargo decks. Your one chance of freedom is to blast through the cargo canisters on each of the 36 cargo bays.

You are armed only with your deflekta bolt which has the unfortunate habit of absorbing energy and getting faster as it hits things. You only have 3 of these so don't lose them.

To make your task even harder patrolling aliens try everything they can to get in your way. Occasionally the contents of the cargo canisters float down and may be of some use to you.

## Game play

To play the game plug your joystick into Port 2 and press FIRE to get ready and again to enter the cargo bay. The ship can only be moved left and right across the bottom of the screen and fire shoots bolts.

To collect special features place your bat underneath the icons as they drop down.

S – Slow down deflekta bolt
C – Catch and hold
L – Forward firing lasers
E – Expand ship
T – Triple deflekta bolt

To enter a high score push up and down on the joystick and press fire to select letter.

## Map Editor

Pressing CTRL E on the title screen or high

score screen will take you to the map editor.

Here you can design the maps of bricks for each level, return to the title screen and play your own designs. The editor also has LOAD/SAVE options so that you can design as many maps as you like and save them off to do more later. This also allows you to swap your designs with your friends and create a new game every time! The only real limitation of the map editor is your own imagination and you can make the maps as hard or as easy as you wish. Below is a list of all the functions of the map editor. It is advisable to clear all map definitions before starting to design.

| KEYS | FUNCTION |
|---|---|
| **STOP** | Back to title screen |
| + | Go to the next map |
| - | Go to the previous map |
| **1 to 8** | Set the brick colour (Black to Yellow) The arrow will point to the currently selected colour |
| **SHIFT 1 to 7** | Set the number of hits for a brick (how many times it must be hit to disappear). NOTE. A brick with 7 hits is indestructable and can only be destroyed by the lasers so be careful not to totally block the path to some destructable bricks as this will result in a never-ending level |
| **CRSR LEFT/RIGHT** | Move the edit box left or right |
| **CRSR UP/DOWN** | Move the edit box up or down NOTE the edit box has a wraparound system. |
| **HOME** | Send the edit box home, i.e. top left |
| **SHIFT HOME** * | Clear the current map Place a brick at the current edit box position with the displayed number of hits and the current colour |
| **DEL or SPACE** | Delete the brick at the edit box position |
| **G** | Get status of brick at edit box position i.e. number of hits required and colour |
| **C** | Copy map. CM 00 is displayed + next map number - previous map number STOP exit copy function Press return when the map No. to be copied is set and it will then be copied into the current map number. |
| **CTRL S** | Save a maps file to current device number The filename will be displayed as MAPS?? STOP Exit save option + Next filename - Previous filename RETURN To save file |
| **CTRL L** | Load a maps file from current device number The filename will be displayed as maps?? STOP Exit load option + Next filename - Previous filename RETURN load file NOTE The filename is always set to MAPS?? where ?? is a 2 digit number allowing up to 100 map files to be saved (00 to 99) |
| **D** | Toggle device number 1 = Tape 8 = Disk |
| **CTRL D** | Disk Directory |
| **CTRL R** | Disk report |
| **CTRL C** | Disk Commands : Enter disk command i.e. S:MAPS 00 RETURN to execute command. |

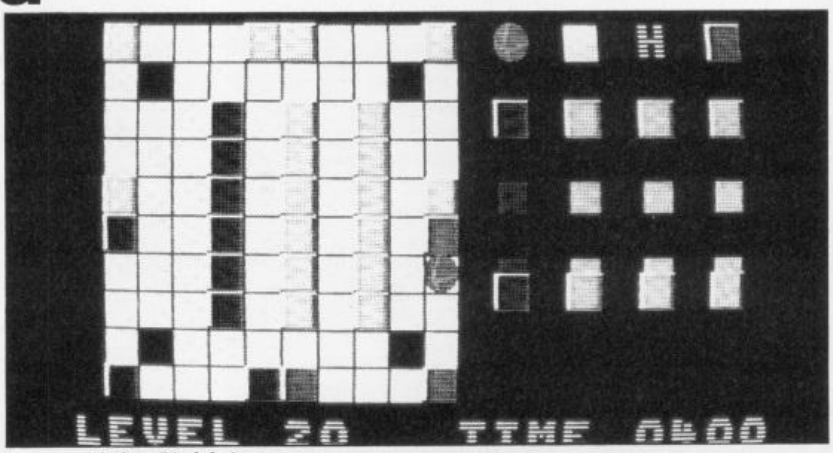
## Loading The Program

To load the program outside the menu type LOAD "BLASTBALL",8 and RUN
The game is now ready to play including maps.

# Colour Bind

Boggle your mind with this complex strategy game – and when you've finished, design your own game and ruin your friends' weekends

**By Mark Mainwood**




*Colour Bind designer screen*

Colour Bind is a multi-level strategy game that will have you tearing your hair out before you've reached the end of it. Solving the puzzles may not be easy, but you have to beat the clock as well. As if that wasn't enough, you can try to improve on the original design – the game comes complete with its own construction kit.

The idea of "Colour Bind" is to work your way through all 20 levels by pushing blocks of the same colour together. So all red blocks must be touching as must all yellow, green and light blue blocks. You control a ball with which you push the blocks. But be careful not to push them down holes or fall into them yourself. Dark blue blocks cannot be moved and act only as an obstruction.

Filters will only allow blocks of the same colour to pass over or be pushed onto them. For example, only red blocks can be pushed across or onto red filters. Screens have varying amounts of time allowed. When you finish a level, time remaining is turned into a score. Running out of time means the loss of a life. If you lose all of your lives on a screen, you will be allowed to restart from that screen by selecting option 2 on the title-page. To start from level 1 select option 1.

Three keys are used:-

'P' – Pauses/Unpauses game

'Q' – Quits to the title-page

'Run-stop' – Quits the current life if you find yourself in an impossible situation.

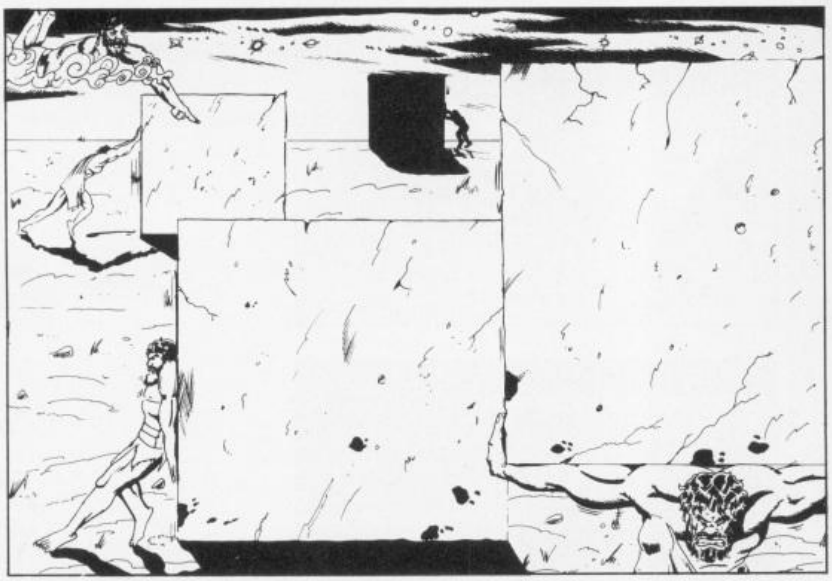
You have three lives to start with and an extra one is awarded every 2000 points.

When you successfuly completed four screens you will have a chance to try a bonus game. (NB. If you start an old game you must still finish four screens.) You will be faced with a network of arrows with a filter at the top of the grid. You must push the block at the bottom of the screen onto the correct trail of arrows so that it follows them to end up on the filter. Success means a bonus of 50 times the time remaining.

The designer allows you to create your own levels. To enter the designer select option 3 from the title-page.

There must be something to connect on all screens so you may not change level, quit, play or save until the ball is positioned *and* there are at least two blocks of at least one colour.

When you are happy with your masterpiece(s) you may save them to tape or disk. Press 'F1'. You will be prompted for a filename and asked whether you want to save or tape or disk. The screen will clear and the levels will be saved. When the screen reappears the operation is over. To load back your levels press "F7" and follow the above procedure.



When you enter this mode you will see level one being displayed on the left, to its right will be a block containing all 16 items you can use. At the bottom you will see a counter showing the level, and next to it the time that is usually allowed for that screen.

At this point the computer is waiting for you to select a level to edit. Push up on the joystick (Port 2) to move up a level and pull down to come down a level. As you do so the screen will change to show the new level. When you have got to the level you want press fire.

You will then see two arrows appear. One pointing to the top-left

square in the grid and one pointing to the ball in the object block. The one in the object block points to the object that you want to position on the game grid. You can move the object pointer using 'CRSR Up/Down' for left and 'CRSR Left/Right' for right. When you have selected the object you want, move the grid pointer (with the joystick) to the square where you want to place the object. Press fire and the object will be placed. You may not place any blocks or holes on the ball or vice-versa. Only one ball is allowed on any one screen. Placing a ball simply moves it from it's old position to the new one.

When you have designed your new screen you may want to change the amount of time allowed to complete the screen. To do this press 'T'. The arrows will disappear. Pushing up on the joystick will increase time by 1 unit, pulling down will increase it by 1 unit, right will increase the amount by 100 while pushing left will decrease it by 100.

If there's no chance for your screen, pressing 'C' will clear it so that the whole grid is filled with tiles and the ball is removed until you reposition it. If you want to select another level to edit press 'L' and follow the procedure described above.

If you wish to quit the designer and return to the title-page press 'Q'.

When you have finished designing a level you may want to test it. Pressing 'P' allows you to do this with 99 lives. 'P' and 'RUN-STOP' work as before in the game but 'Q' will return you to the designer and the current screen being edited.

## Quick Key Guide.

| KEY | PURPOSE | JOYSTICK |
|---|---|---|
| Q | Quit to title-page | None |
| L | Choose level | UP : Move up a level.<br>DOWN: Move down a level.<br>FIRE : Confirm level. |
| T | Set the time allowed | UP : Add 1 to time.<br>DOWN : Take 1 from time.<br>RIGHT: Add 100 to time.<br>LEFT : Take 100 from time. |
| C | Clear the game grid | None |
| CRSR l/R | Move the object pointer l/r | None |
| CRSR u/d | Move the object pointer u/d | None |
| F1 | Save | None |
| F7 | Load | None |

# Border Sprite

Don't let your C64's borders go to waste – they can give you useful screen space.

**By Jason Finch**

Up until about two or three years ago sprites in the border were absolutely unheard of and for a long while after, only the top games programmers, such as Jeff Minter, knew the secret, keeping it closely guarded for fear that their rivals would steal the new game sensation.

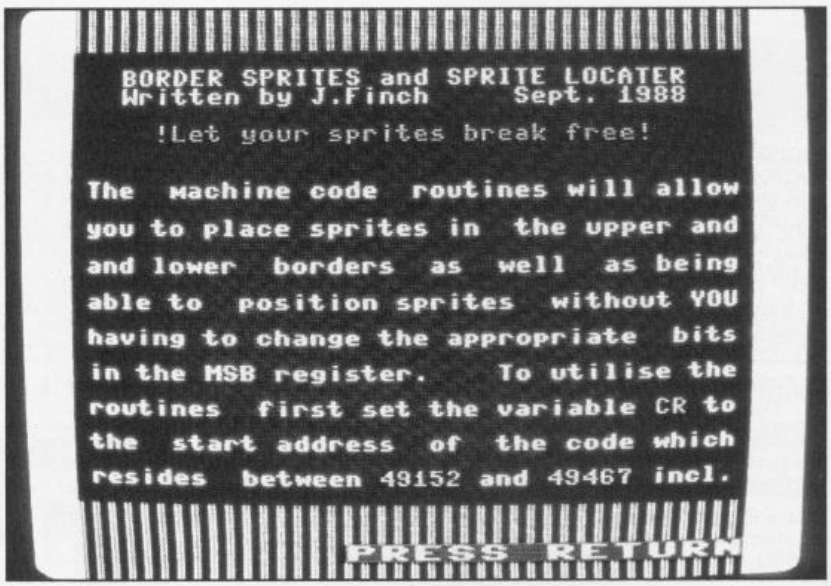
The concept of sprites in the border is one of the many hidden extras that the Commodore 64 has to offer and in fact it opens up a whole new field of interest despite the effect being surprisingly simple to use. Not only can game scores be displayed in the border without the problem of obscuring valuable game-playing area but also characters from the ROM can be downloaded into sprite definition areas and this sets up another branch on the ever-growing tree.

For example, to set your trains of thought into motion, smooth scrolling messages can be constructed this way without having to use interrupts. These will not even interfere with, let alone be any part of the standard screen data. It will not matter what your character set looked like if you required User Defined Graphics and it won't even make any difference if you had no alphanumeric characters whatsoever. Instructions such as "PRESS RETURN TO CONTINUE" can be set up in this way.

Whatever your programming ability, sprites in the border are sure to enhance the presentation of your programs.

The program here features not only a machine code routine to allow sprites to be displayed in the border, but also a sprite locater to get you on the way and all in less bytes than there are pixels horizontally across the screen!

The introductory program named "BORDER SPRITES" will allow you to change the start address of the code if you wish from the default 49152, as well as giving you the option of saving the code to disk or tape. Here, I shall assume that you leave the code at 49152 ($C000).




When you type SYS49152 from Basic to activate the routine an introductory message appears informing you that it is active. Pokeing the value one into zero page location two (ie. POKE 2,1) will cause the routine to bypass this message.

The program allows sprites at any vertical position to be displayed although it does not cater for sprites in the left-and right-hand borders.

The sprite locater routine is called from Basic with a SYS49155,sn,x,y where 'sn' is the sprite number between 0 and 7. If 'sn' exceeds the latter value the computer is likely to lock up! 'x' and 'y' are the co-ordinates of the sprite (x from 0-360 and y from 0-255). As you can see, although the x value can exceed 255 there is no option for you to alter the MSB register.

This is because that is all handled by the program and so you have no need to worry about your ANDs and ORs. Some extra words of caution: the routines use zero page addresses 251 through to 254 ($FB to $FD) for storage of information and so pokeing to these locations may be disastrous! LOAD, SAVE and VERIFY commands will have the same result if the 'S.I.T.B." routine is active. Also, the routine alters the Hardware Interrupt Vector (788 and 789 or $0314 and $0315). I hope the program provides you with an insight into this amazing and relatively new technique and will start you producing even better programs with an even more professional finish.

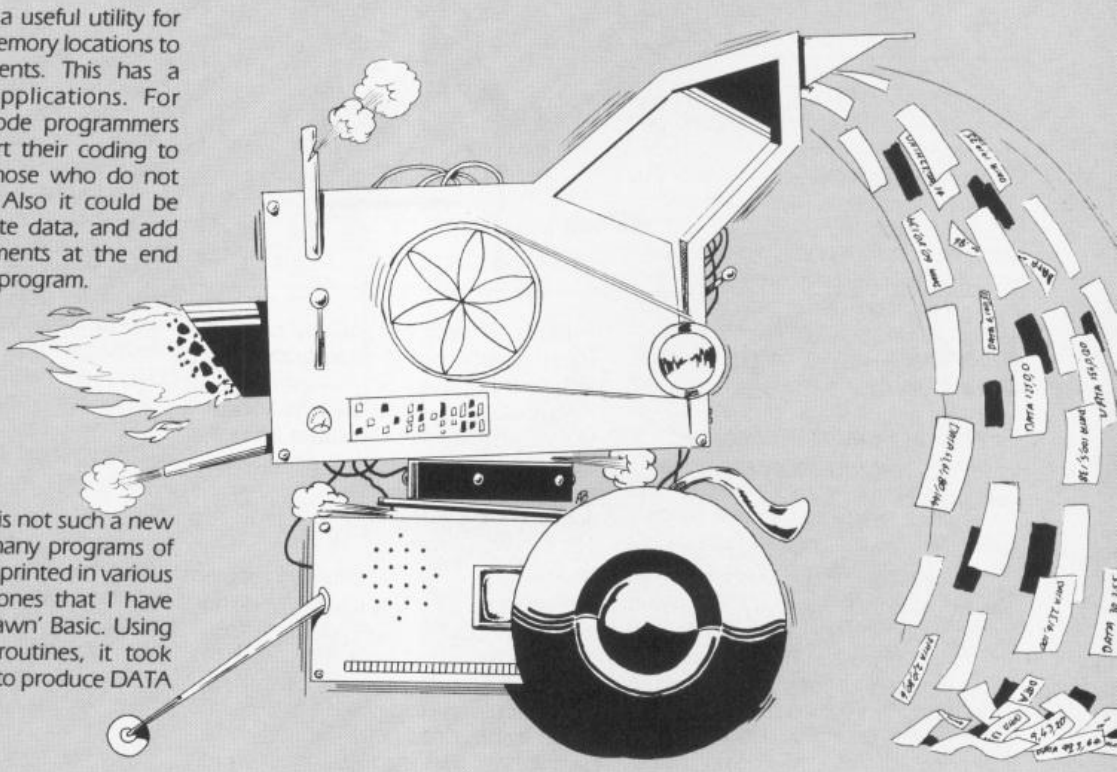
To load the program type: LOAD "BORDER SPRITES",8 followed by RUN and return. The program will then set up some sprites and load the main code from disk – filed under "MCODE". When code is saved by the program it is saved as "Bord. Spr. xxxxx" where xxxxx is the start address of the code. This can be renamed as you desire (if you saved to disk) with the standard RENAME command.

# Data Maker

Incorporate your machine code routines into Basic programs

**By Sanjeev J Massey**

Data Maker is a useful utility for converting memory locations to Data Statements. This has a varied range of applications. For example machine code programmers may want to convert their coding to a Basic loader for those who do not have an assembler. Also it could be used to convert sprite data, and add this as DATA statements at the end of the resident Basic program.



You may say, this is not such a new thing, as there are many programs of such a nature already printed in various magazines, but the ones that I have seen have been in 'yawn' Basic. Using one of these Basic routines, it took more than 6 minutes to produce DATA statements for 2K of code, with this piece of code it took less that 3 seconds.

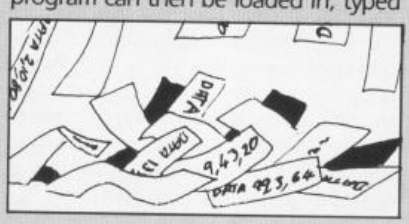
Another added feature of the program is that it seems to occupy only 15 bytes of memory. This is because the main program is 'hidden' under the Basic Rom. A 'driver' program starting at 53232 ($CCFO) is used to access the program by typing SYS 53232. This routine is relocatable by changing the variable SA in line 35 to the address you wish to start at.

To start with, the program will prompt you with the starting line number, and then with the increment per line. This line number is in the range 0-65535, and the increment 0-999. No error checking is done on the range and care must be taken in inputting a start line number and not going over the range by too high an increment.

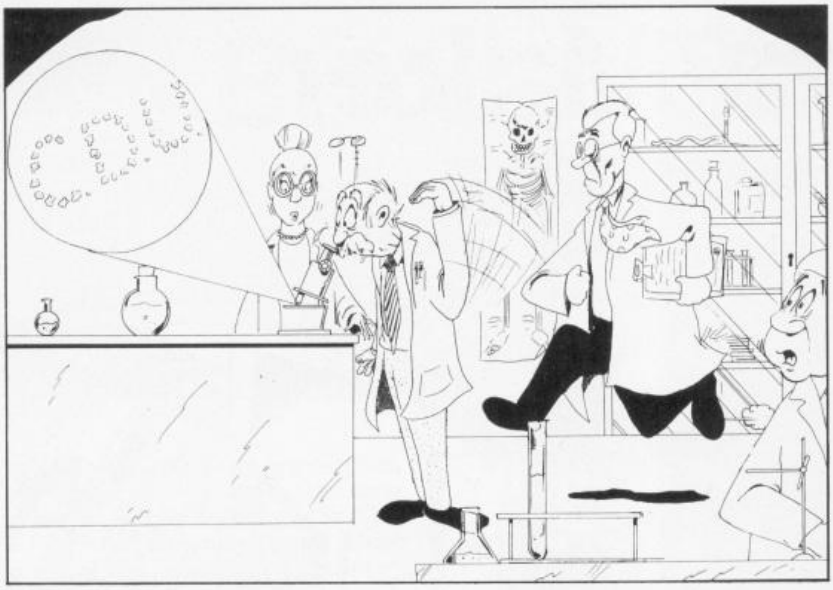
When the line increment has been inputted the program will ask for the start and end address of the locations of the datum or code. Conversion will take place immediately after this. Each line has a set of eight bytes together with a checksum of the data at the end.

If you want the program to add the Data lines after a Basic program already in memory, the start line number you specify MUST be higher than the last line number in your program, or you will have some problems!

The normal procedure of using this program is to load it first, run it and then NEW it. The machine-code program can then be loaded in, typed in or whatever your preference. The Data-Maker program is then used to convert the machine code, sprite data, and so on as stand alone DATA statements or after your Basic program you have typed or loaded in.



If you have access to a machine code monitor, you can save the code itself by the following procedure. After running the program access the monitor and use it to look at the location 0001 (this is M 0001 0002 in most monitors). 0001 should contain $37, change this to $36. If the monitor crashes at this point forget the rest as you would not be able to save the code, sorry!... If you're still 'with' us and the computer isn't doing the 'I'm not listening no matter how hard you press the RUN/RESTORE' routine you may save your code by the usual method used by your monitor. The main program is at $A000-$A454, and the driver at $CFFO-$CFFE.



# Life

Get hip to cellular automata with this traditional computer simulation

Life is a mathematical game devised by the Cambridge mathematician John Horton Conway. Following its introduction by Martin Gardner in *Scientific American* in 1970 it swept the computing world. Having encountered various Basic versions and finding them to be crude, slow and difficult to use I decided to write my own 'deluxe' version.

## The rules of Life.

In its pure form, Life is played on an infinite grid – this is reduced in my version to 40x24. Each grid point can either contain a cell or be empty. The object of the game is to set up an initial configuration of cells on the grid and then apply Conway's 'genetic laws' for births, deaths and survivals. These laws were carefully chosen to make the behavior of the population of cells both interesting and unpredictable.

To understand the rules, note that each grid point is surrounded by eight neighbouring points. The rules are:

* Survivals. Each cell with two or three neighbours survives.
* Deaths. Any cell with four or more neighbours dies of overcrowding. Any cell with one or no neighbours dies of isolation.
* Births. A new cell will be born in each empty point surrounded by exactly three cells.

All births and deaths occur simultaneously and constitute a single generation in the life of a configuration.

## LIFE: The program.

The program is almost entirely joystick-driven and uses a pull-down menu environment. On start-up the screen displays the rules, press fire to get to the main screen. You will see a black strap across the top of the screen with four menu titles, one of which is highlighted. Pull the joystick down to enter the grid – fire will set or clear cells. To regain the options strip move the cursor to the top of the screen. Pressing fire with an option highlighted will pull down a menu – either select an item or press fire on the menu title to close the menu. Experiment with the various options.

## Getting through life

The program contains 8 predefined screens; call the first up by selecting STORAGE, then GET SCREEN, then INTRO. The screen shows 10 simple patterns – using STEP (ACTION menu) you can inspect their life histories. Of the five with three cells the first three die after two generations, the fourth becomes a stable block of four cells and the fifth alternates between two states – this particular pattern is known as the 'blinker'. The second row shows five patterns of four cells each.

Number one is stable, two and three become a stable figure – the beehive – in two generations, number four in three. The last is more interesting; in nine generations it forms four blinkers – the 'traffic lights' configuration. Patterns frequently evolve into stable forms – some common ones are on the screen STILLIFE. In order these are beehive, loaf, pond, tub, block, snake, barge, boat, ship, aricarrier and fishhook!

The fascination of Life is its unpredictability. For example H AND PI shows two very similar shapes with very different histories – use RUN (ACTION menu) to see for yourself. Many interesting oscillators have also been found. OSCILL1 shows three oscillators of period two – the beacon, clock and toad. OSCILL2 shows a selection of larger oscillators of various period. Try entering a line of five cells, a space and then another line of five, centre them on screen (CENTRE, via EDIT menu) and RUN to generate the spectacular 'Pulsar CP 48-56-72'..

## Gliders and beyond...

One of Conway's most remarkable discoveries is the glider (see screen GLIDERS). This five-cell form actually moves diagonally across the grid! The possibilities of colliding gliders with other objects and with each other are fascinating. There other 'spaceships' have been found – see screen SPCESHPS.

Conway originally conjectured that no initial population in Life could grow (in numbers) without limit, and offered a $50 prize for the first proof or disproof. The prize was won in November 1970 by a group at M.I.T. One of the group, R. William Gosper, made an incredible discovery – a gun that fires gliders! The configuration in screen GLIDEGUN becomes a glider gun, firing its first glider at generation 40 and then every 40 generations. As each glider adds five cells to the grid, on an infinite grid the population obviously grows without limit.

## Finally..

Enjoy playing Life – experiment, theorise, have fun. Send in any interesting configurations – I would be glad to see them. For more information on Life, I recommend Martin Gardner's book *Wheels, Life and other Mathematical Amusements.*

# Menu Maker

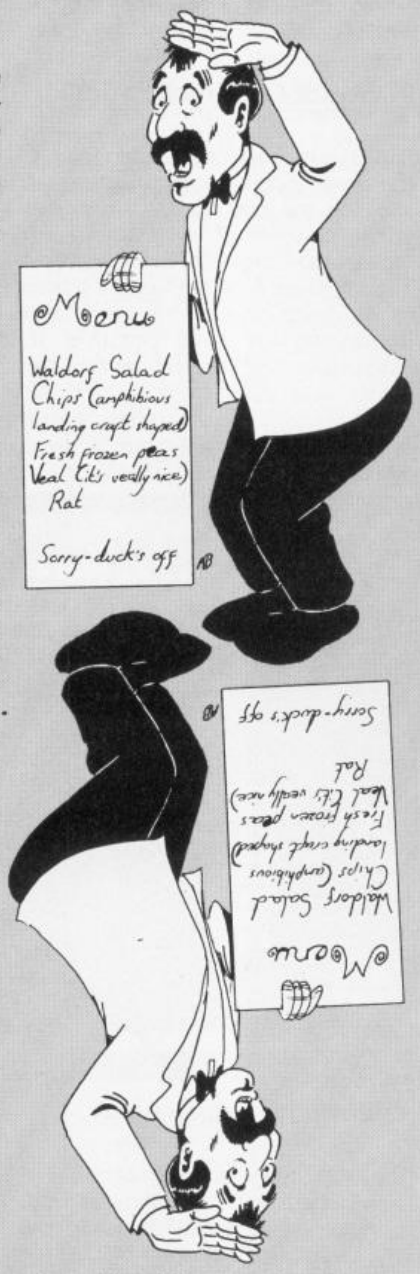
Give your C128 programs that professional look with this easy to use utility

**By Nick Gregory**

Menus form the link between subroutines of most non-games programs, but all too often a crude menu design will let a program down because not enough thought has gone into its presentation. To overcome this, Menu Maker is a set of Basic routines which will allow you to incorporate a professional looking menu into your programs.

MENU MAKER produces the bar type menu at the top of the screen with submenu options dropping downwards when selected. The area under the menu is preserved so when each submenu is closed the screen returns to its original state. This includes colours, underlines and flashing (if you use the 80 column mode). All you need to do is put the options for both the Main menu and the submenus into DATA statements and the routine will deal with the rest. Normally the submenus drop from the option on the TOP menu, but if the suboption is too long to fit on the screen from that point it is automatically repositioned. All you need to worry about is that each option is not more than a screen line long. The main menu is also formatted.

There are two parts to Menu Maker. The first is the BASIC program into which I have put lots of REMs so that you should find it easy to put in your own modifications. Colours, for example, can be added. The BASIC program should be used as a whole except for the first 10 lines which only act to demonstrate the program. These can be deleted. The DATA statements should be replaced by your own options. Enter any number of options, but follow the rules given in the DATA statements. The routine will try to cope with however many options you like, but there are limits, though you'll find these out when the menus are printed! Notice that there is a last option flag. You will see how this is used when you RUN the program and select EXIT. It is probably a good idea to avoid using variables in your own program which start with an M because they may clash with the variables used in the routines.




The second program is a short machine code routine which moves the screen contents to safe RAM and back to the screen when needed. The routine has a default safe RAM address at $1300 and a default BANK zero. You can change these with the sys call:

SYS DEC("0C00"),ADRSS LOW,ADRS HIGH, BANK

You must include all parameters and it is up to you to make sure that the RAM available is big enough to take all the screen data.
Screen data can be saved to RAM by the call:

SYS DEC("0C03"), number of lines

This will save the required number of lines of screen text. Note that in fact the number of bytes saved is DOUBLE the screen area because colours or attributes are saved as well. So for 10 lines of 40 column screen 800 bytes are saved, and for 10 lines of 80 column screen 1600 bytes are saved. As I said above, its up to you to make sure you have set aside enough safe RAM to do this. You can save from one line to the whole screen using this instruction.
Screen data can be retrieved from RAM using the call:

SYS DEC("0C06")

The amount of screen retrieved will be the same as the amount saved by the last instruction.

The Menu Maker routine is designed to be incorporated into your own BASIC programs and to help you do this, a MERGE routine has been included. The memory used by this routine is the same as that used by the Menu Maker code so be careful. Start the merge routine with SYS DEC("0C00"). You will be asked for the file name to merge from disk. The routine will abort if there are any disk errors. This merge routine will incorporate lines into the BASIC program and prompt you if a line already exists. You can of course use if for other programs.

# Microdot

Can you save the world from radioactive doom?

**By Jim Blackler**

In the 22nd century, microchip technology has become so advanced that conventional methods of repair are obsolete. But when a vital military satellite passes through a freak radioactive storm and begins to malfunction, something must be done - quickly.

The "Microdot" is a tiny remote-controlled craft capable of entering the machine and absorbing the 99 radioactive particles which litter the complex labyrinth. Your job is to control this craft, but your mission isn't going to be easy; dangerous build-ups of static electricity hinder the task by causing Microdot to overload on contact.

When you've collected all of the particles, you'll have to re-activate the circuit and get Microdot out alive within a set time limit. Not an easy task, but you must succeed - the safety of your country depends on your skill and competence.

## Loading it up

LOAD "MICRODOT",8,1 loads the game. C128s must be in C64 mode.

Use a Joystick in port two; Left and Right moves horizontally. Fire causes Microdot to jump. Holding up and pressing fire activates the jumpdrive (as will space).

Keys; SPACE: Activates jumpdrive. RUN/STOP: Pauses gameplay. After pausing; RUN/STOP restarts, CLR aborts to the title screen.

## Game play

For extra height, use the space bar to activate the "Jump Drive". There is a limit of five jumps per game.

Bonus triangles: Give one of six random bonuses.

Conveyor belts: Carry Microdot in their direction of flow.

Reset pointers: Contact with these blue squares marks the return point after each death.

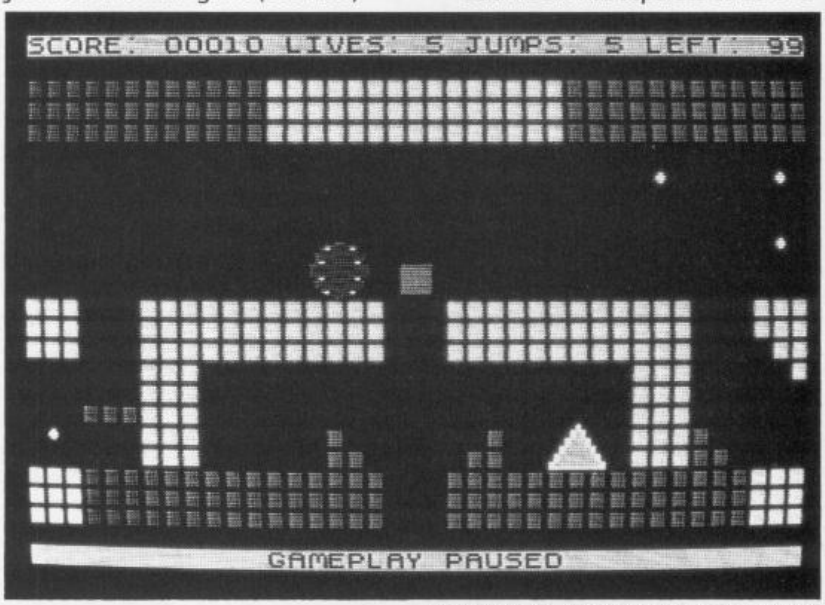
Spark traps: A dangerous spark fluctuating between two points.

Rubber mats: Cause Microdot to bounce.

## Microdot Construction Set

For players with creative tendencies, the game includes a construction set allowing the user easily to design a whole new set of levels with every facility of the original at their fingertips. To start, press 'E' on the 'demo' section.

To keep the game fresh and interesting, it isn't possible to manipulate the default levels; the layout will initially be cleared for replacement. To demonstrate the program, a small mini-game is saved just after the main game (See later).




## Editing the game layout

The landscape is made up of blocks of 3 x 3 characters; including the reset triangles, rubber mats, etc. Each level is a 13 by 7 matrix of 91 blocks; the main labyrinth is a 12 by 12 matrix of 144 levels.

The joystick directs the cursor through the levels. Leaving the matrix causes a return to the 'demo' section, as does the backarrow key (top left on the keyboard). If a lettered key is pressed, this becomes the block selected; the cursor now lays this block when fire is pressed. Hold down INST-DEL to display all of the blocks available. The function keys alter which of the four different brick styles is drawn.

To make the cursor delete, press the @ (at) key - just right of 'p' on the keyboard; to set the start point, press the = (equals) key. Test your layout by pressing backarrow and starting the game.

Two blocks (F and X) consist of 3 x 3 blobs of electricity, and appear to be identical. They are not. Always use F, except when the blocks form a "pool" imbedded in the ground.

Each room has separate colours for the blobs of static electricity, the rubber mats and the four different brick types-normally changed with keys 1 to 6. But as these keys are also used to edit the sprites, their function depends on a letter at the base of the screen, toggled with the "return" key. When it is 'C', the numbered keys change the colours, and when 'S' they edit the sprites.

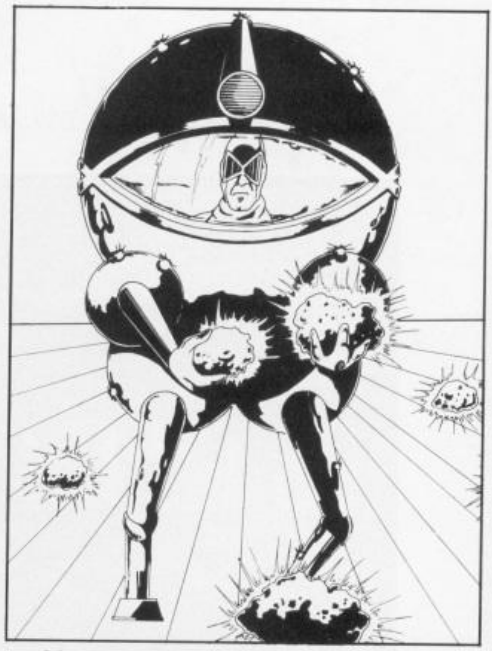
Remember; The sides of adjacent rooms must agree; a passage in one room cannot lead into the wall of another. With spark traps, use the 'N'

block to lay the beam between the pointers.

### Editing the sprites

The moving blocks of electricity, radioactive particles, bonus triangles and the final electricity switch are all sprites. A maximum of seven sprites is allowed for each room, each with its own reference number. To create a new sprite, press the lowest unallocated number (eg. Press 6 on a screen with 5 sprites, 1 on a screen with no sprites, etc.). To edit an existing sprite simply press its number.

Change where a sprite starts by moving the joystick –alter its colour by pressing 'C'. Press 'T' to move through the four sprite types. Sprites can be wiped with 'W', or fixed by pressing fire.



Moving sprites travel for a certain time, then reverse. This time is measured by the "RU" value (see base of screen), and is changed with the + and – keys. 'D' changes the direction in which it starts, 'S' changes its movement speed, and 'A' its animation speed. To see how a sprite will look in the game, hold down the left shift. Remember – Sprites must NEVER overlap.

### Editor Control Summary

| | |
|---|---|
| **Joystick (directions)** | Moves cursor |
| **Joystick (fire)** | Lays block |
| **Lettered key (A to Z)** | Sets block for cursor to lay |
| **@ (at)** | Sets cursor to delete |
| **INST-DEL** | Displays a plan of the blocks |
| **Backarrow** | Returns to 'demo' mode |
| **Ctrl** | Enters 'media-transfer' mode |
| **Left shift** | Tests proposed animation |
| **= (equals)** | Sets Microdot's start |
| **F1** | Sets style to blocks (one) |
| **F3** | Sets style to waves |
| **F5** | Sets style to spheres |
| **F7** | Sets style to blocks (two) |
| **Return** | Changes purpose of numbers * |

* If 'S' then numbers edit relevant sprites.
If 'C' then:

1 Changes static colour
2 Changes rubber colour
3 Changes block (one) colour
4 Changes wave colour
5 Changes sphere colour
6 Changes block (two) colour

### Sprite mode

| | |
|---|---|
| **Joystick (directions)** | Positions sprites |
| **Fire, or Return** | Fixes sprite |
| **T** | Adjusts type |
| **C** | Adjusts colour |
| **A** | Adjusts animation speed |
| **S** | Adjusts movement speed |
| **D** | Adjusts starting direction |
| **W** | Wipes selected sprite |
| **+ and – (plus and minus)** | Adjusts sprite area |
| **Left shift** | Tests proposed animation |
| **Backarrow** | Returns to 'demo' mode |

### Making your plan complete

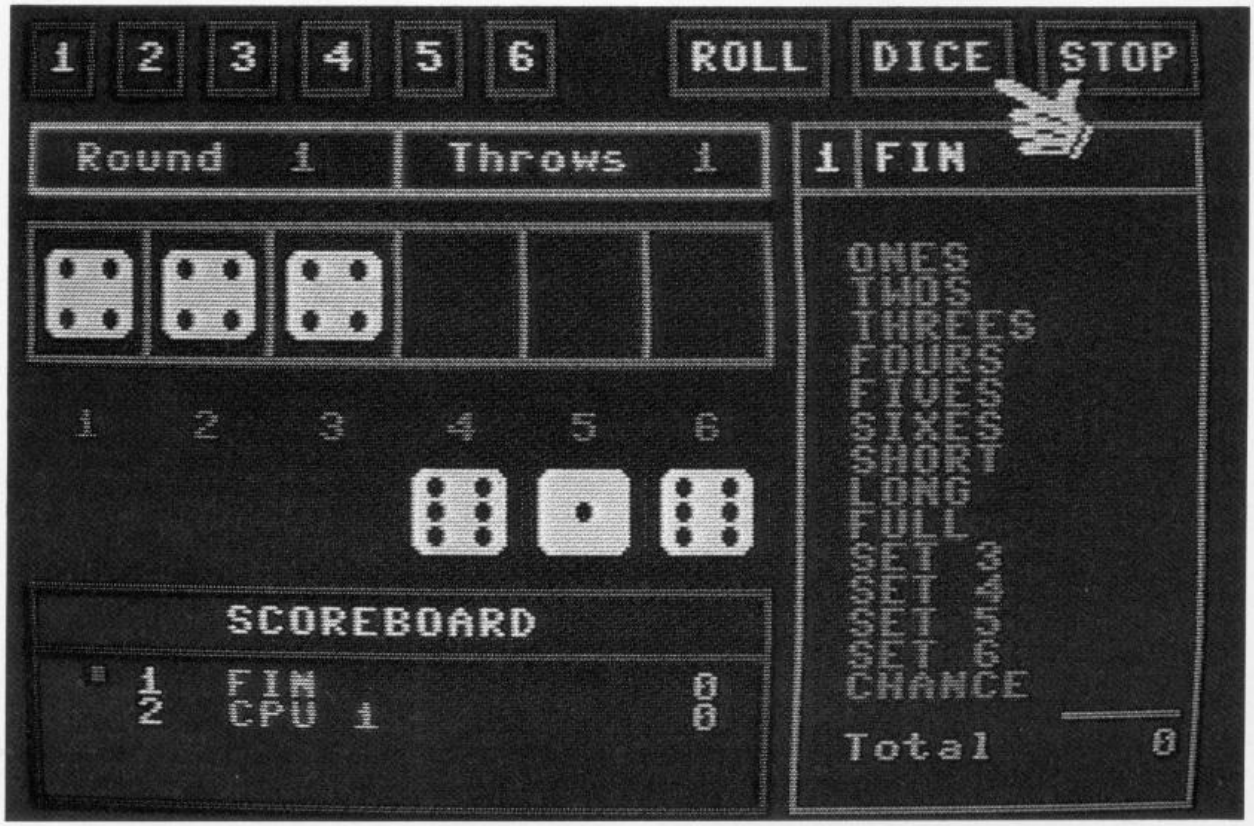
To succeed, the player must collect all of the radioactive particles, find an "electricity switch", then leave by the gap automatically created for his escape. Use the sprite editor to lay the switch in any room you choose. The gap is always in the top left corner of the first room – marked by bricks when the layout is first wiped, and impossible to delete. It will be removed automatically, but make sure it's possible for the player to escape.

Press CTRL in the editor to save or load your designs. On Disk, one layout per side is allowed; use a formatted disk with at least 78 blocks spare. There is a small demonstration of rooms saved just after the game itself, to allow experiment with the designer. To load, select option "3" and wait.

# Spots

An ingenious strategy dice game for up to four players

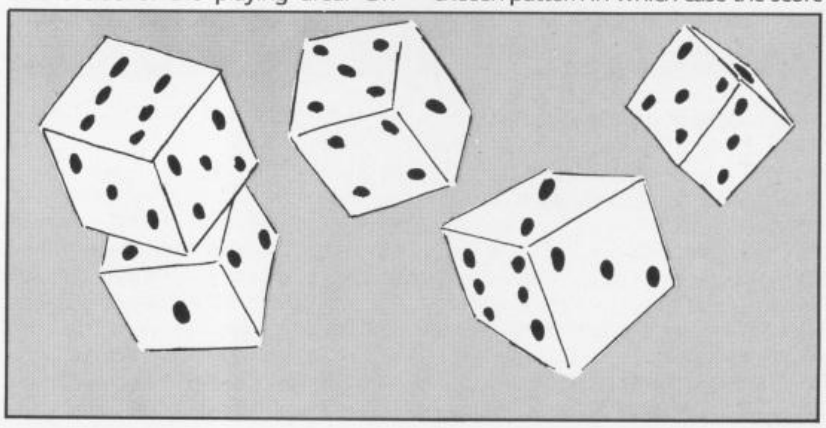
**By Keith Suddick**

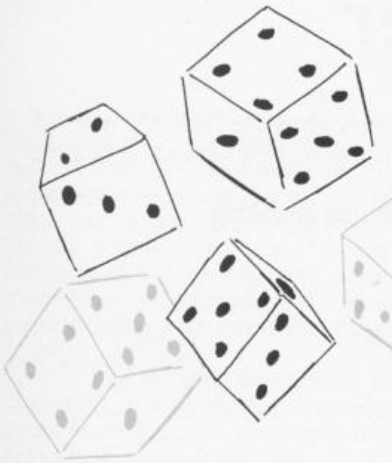



Spots is a dice game for up to four players, although the game allows the computer to play as any or all of these players. Brief instructions are included in the game and a more detailed explanation is included below. The game is similar to some commercial dice games but uses more dice and slightly different rules that increase the strategy element of the game.

Play involves initially rolling six dice and subsequently choosing to hold on to or roll, any or all of them in up to a maximum of three further throws. The aim of each throw is to try to use the dice to make one of a number of scoring patterns. Thus the skill lies partly in choosing which dice to hold on to and which to rethrow, and partly in deciding how best to score the result.

There are fourteen patterns or categories that a player may aim for and these are listed on a score-card at the side of the playing area. On completion of each throw a score *must* be entered in one of these categories, even if the dice do not complete the chosen pattern in which case the score





for that category will be zero. So a complete game consists of fourteen rounds, each player filling one category on his score-card each round.

The fourteen categories can be broken down as follows. The first six are the number categories "ONES" to "SIXES" and are used to score any pattern of dice that contains any dice of the selected value (ONES=1, TWOS=2 ...) – the score in each case is the sum of the spots on these dice. For example the dice pattern 6 6 1 4 6 4 would score 1x1=1 point in "ONES", 2x4=8 points in "FOURS" and 3x6=18 points in "SIXES". If the pattern contains no dice of the selected value, then the category score would be zero.

The next three categories are "SHORT", "LONG" and "FULL" and are used to score patterns that include a number of dice whose spots are in order. "SHORT" requires at least 4 dice in order so any of 1 2 3 4, 2 3 4 5 and 3 4 5 6 will score the 10 points available. "LONG" requires 5 dice in order so 1 2 3 4 5 or 2 3 4 5 6 will score the 20 points available. A "FULL" requires all six dice to be in order so only 1 2 3 4 5 6 will score the 30 points here. (Note: The dice do not have to be displayed in the given order, the points will be scored as long as each of the dice needed is somewhere in the final pattern.)

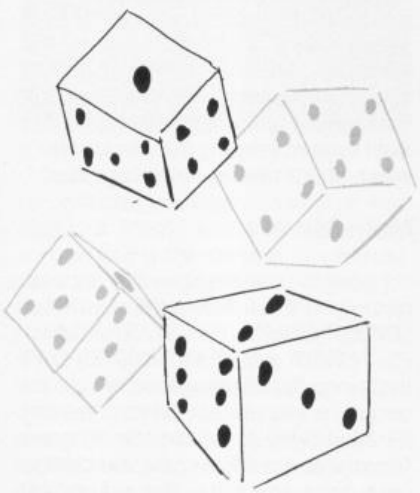
The four categories from "SET 3" to "SET 6" are used to score patterns which have a number of dice showing the same spot pattern. "SET 3" requires at least three of the dice to be the same, "SET 4" requires 4 dice the same and so on up to "SET 6" in which all six dice should be the same (which does not happen very often!) The scores for these categories are 20, 30, 40, and 50 points respectively.

The final category is called "CHANCE" because it is a chance to score ANY pattern of dice, the score is simply the sum of all the spots shown on the six dice, so 2 4 1 2 6 2 would score 2+4+1+2+6+2=17 points, the minimum score is 6 and the maximum 36 so don't waste it.

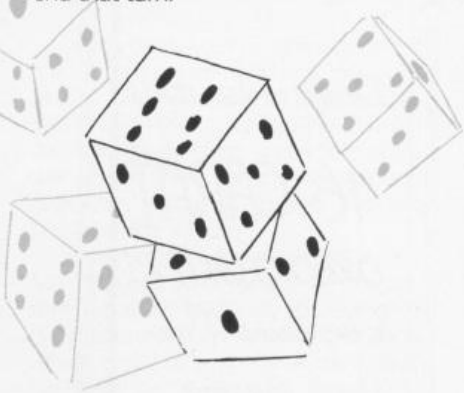
In addition to these scores two BONUSES are awarded, the first is concerned with the number categories "ONES" to "SIXES"; if the sum of the points in these six categories is greater than 69 a bonus of 50 points will be added to the player's score. The second bonus is awarded at the end of each game, for each player it starts at 25 points and is reduced by 5 points for each category with a zero score, so if a player has more than four zeros on his card he will get no points from this bonus.

Control of the game is achieved using a joystick in port number 2. The joystick will control a "cursor" on the screen, use the joystick to point the cursor at the required function and press the button. There are several selections to be made at the beginning of each game, such as number of players, but these are self explanatory. On the main screen of the game are several options;

The numbers "1" to "6" are used to move dice into a "rack" in which the may be kept whilst other dice are re-thrown. To store a given die in the rack, simply select the number that is shown below that die.



The remaining three options are:- "ROLL" which is used to re-throw any dice that are not stored in the rack, "DICE" which is used to empty all the dice out of the rack – in case you change your mind or find a better pattern to keep, and "STOP" which will move all of the dice into the rack and end that turn.



In a similar way, scoring is done by pointing the cursor at the selected category on the score-card and pressing the button. Choose carefully as mistakes cannot be taken back!

The only section not controlled by the joystick is the entering of player's names. This is done directly through the keyboard. Names may be any alphanumeric sequence of up to ten characters, the names are not checked in any way as they are purely for the benefit of the players.

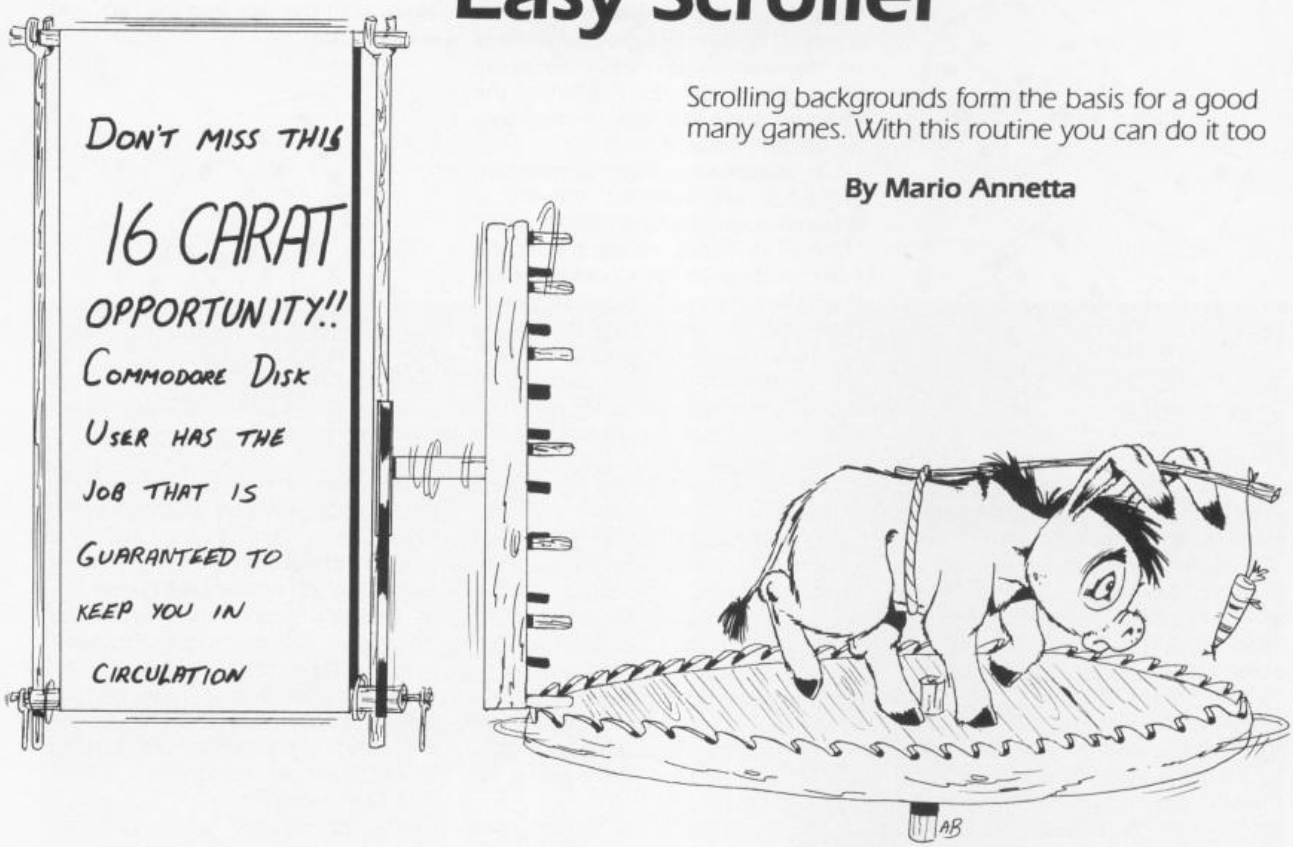
As explained in the program, to make the computer play for a particular player, simply press the Return key without entering any name for that player. The computer will give its first player the name CPU 1, second CPU 2, and so on.

For anyone interested, the strategy of the computer players is based simply on probability and loss minimisation – the computer will attempt to make the pattern it thinks has the greatest probability of success and will score the results so as to lose the minimum number of points. As the game is largely dependent on chance – the spots on the dice – this strategy is sufficient and the computer will play a reasonable game. In general scores during games tend to be close until the later rounds and it is very easy for the situation to change suddenly – particularly when any bonuses are added.

At the end of the game the score cards will be shown along with the finishing positions of the players involved. Pressing the Return key as indicated will return to the title screen and the start of the game.

At any time between the title screen and the final scores the game may be aborted and re-started by pressing the Control (CTRL) key.

# Easy Scroller




Scrolling backgrounds form the basis for a good many games. With this routine you can do it too

**By Mario Annetta**

Easy Scroller is a machine code program for the Commodore 64, that provides the Basic programmer with an easy way of creating a scrolling background picture for adventure or maze type games. The scrolling is one character at a time, not smooth (one pixel at a time) scrolling. It still, however, gives the pleasing effect of a moving background.

The background area can be quite large, but the window through which it is viewed may be fairly small (5 by 5 characters), giving you room to write text on the screen around the window display. You select the dimensions of both of these, then draw the background using the standard keyboard character graphics. When you are finished drawing, the background data is saved to a disk file, along with the machine code which handles the scrolling. This file, when LOADed, gives you easy access to the scrolling window with just a POKE and a SYS. All of this will be explained in more detail later on.

You start Easy Scroller by typing SYS 49932. The screen will clear and the first of four questions will appear, asking you for the background width. Also shown will be the minimum (40) and maximum (89) allowable values. Enter a number between these values, then press RETURN. You will next be asked for the background height, and then for the window dimensions. Simply input a number within the values shown in each case. You may need to experiment to get the background and window sizes you like, but I suggest keeping the window fairly small, about nine by nine characters.

## Main Menu

After this a small menu appears giving you the following options: F1 – SCREEN COLOR, F3 – START AGAIN, F5 – DRAW BACKGROUND. Press F1 to change the screen colour, which can be any colour except white. Pressing F3 allows you to restart the program from the beginning, in case you change your mind about the size values you chose previously. When you press F5, the screen will blank, and you will see the cursor flashing in the top left corner of the screen. You can now start drawing.

You draw the background simply by typing on the keyboard using the standard keyboard graphics, numbers and letters. You can also use reverse mode and change character colours in the normal way (hold down CTRL while pressing the appropriate number key). All of the characters that you type are recorded and stored in memory. Some of the keyboard graphics are ideal for creating walls or rooms, or you might use a symbol like the asterisk or the plus sign to represent a single item. I suggest that you first map out your background on graph paper, then transfer it to the screen.

When drawing, the screen will be a window on the background, allowing you to get a 40 by 24 character view of it. Since the background would normally be bigger than this (minimum size 40 by 40), you can scroll your view of the background around using the function keys. F1 scrolls the view upwards, F3 scrolls it down, F5 scrolls left and F7 scrolls right. You will need to use this scrolling function in order to draw in every part of your background.

As you're drawing, always keep in mind the window size that you chose at the beginning. If for example you chose a 9 by 9 window, make sure

you don't leave any 9 by 9 areas of empty space in your background, or you will have no reference to movement when scrolling through this area. Also, I suggest drawing a border around the extreme edges of the background. The scrolling stops when these edges are reached, so it makes sense to display a border marking these limits.

The data for your background is stored in two different memory locations. The actual characters are stored in the RAM sitting under BASIC ROM at 40960-49151. The colour data is held in RAM under the Kernal ROM at 57344-65535. The Easy Scroller program itself is in RAM at 49152-50660. This means that none of the BASIC memory area is used up by the data, which can take up to sixteen thousand bytes of memory for a large background.

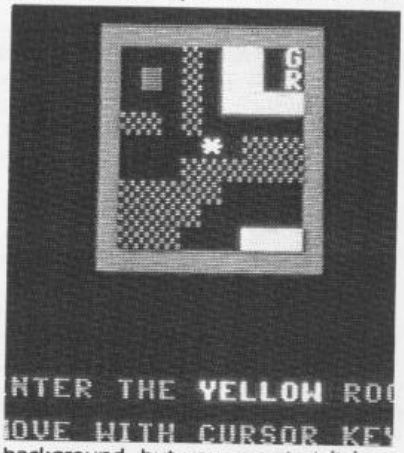
When you have finished drawing, the three memory areas mentioned need to be saved to disk as one file. To do this, press F2 (shifted F1). A message will appear asking you to place a data disk in the drive. Do this then press RETURN, and your background will be saved to disk in a file named ES-DATA. Make sure that the disk doesn't already contain a file of that name before saving. After it is saved, you can rename ES-DATA to whatever name you want. The first stage (creating the background) is now finished. The next stage to learn is how to use the background in your BASIC programs.

The file that was saved called ES-DATA contains the character and colour data, and the machine code program. Before you start writing your BASIC program, LOAD and RUN ES-DATA, then type NEW. The file loads into the BASIC memory area, but when you RUN it, it moves itself into the three areas mentioned previously. You can now start writing your program, or LOAD one that you have previously saved.

You make your window appear on the screen simply by writing the command SYS 49168 in your program. This will draw a window of the size you originally chose, and place it on the screen centered left to right, and located one line below the top of the screen. The window doesn't move from this position, only the view in it does. In the window you will see the characters you drew at the top left corner of your background.

Continually using SYS 49168 on its own will simply redraw the background at the same locations that it was previously drawn. If you want to update the location, thereby scrolling the view in the window, you first POKE location 49623 with one of the following: 1 to scroll up, 2 to scroll down, 3 to scroll left or 4 to scroll right, then use SYS 49168. For example, to continuously scroll down from the top, whereby the background appears to move upwards as your view of it moves down, you could put the following commands into a continuous loop: "POKE 49623,2: SYS 49168". The picture in the window will continue scrolling until it reaches the bottom edge, then it will stop.

Normally the view in the window starts at the top left corner of the




background, but you can start it in a different position by first POKEing the co-ordinates you wish it to start at, into locations 49620 and 49621. The first co-ordinate is the number of columns from the left edge of the background, and the second is the number of rows from the top. For example "POKE 49620,10: POKE 49621,5: SYS 49168" will set the background location at ten characters from the left, five from the top, then draw it in the window. This method can be used to make large changes to the position of the background view at any time. Note that the extreme top left co-ordinates of the background are column zero and row zero, not column and row one. The character residing at the coordinates that you select, will be the one drawn to the top left of the window.

If you want your program to detect the current column and row positions at any time, you can PEEK locations 49610 and 49611. Location 49610 holds the column number, and 49611 holds the row number, of the background character displayed in the top left corner of the window.

The first BASIC program on the disk, Scrolli 1 uses some of the techniques outlined above to display your window on the screen. it has an input loop which continually checks if the cursor keys are being pressed. Pressing a specific cursor key while the program is running will scroll the view in the corresponding direction.

## Adding more

You can use a simple program like this to check your screen data after you have saved it, but it doesn't really make a very interesting game. There is a lot you could add to these Basic lines to make an interesting adventure game. For a start you could make it joystick controlled by reading the joystick port registers (locations 56320 and 56321) instead of the keyboard. Also, you could draw a little border around the window to make it stand out from the rest of the screen.

A good idea is to have a character drawn in the window which represents the player. I like to draw an asterisk in the middle of the window by POKEing its code (42) to the appropriate screen memory location. In the program previously shown, this would be done in line 80 immediately after the command "SYS 49168" which redraws the window. You will also need to POKE the character's colour code (0 for black, 1 for white etc.) into the correct colour memory location. The colour and screen memory locations that correspond to the centre of your window will vary depending on the window size. You can work both out with the following equation. For colour memory substitute the number 1043 in the equation with 55315.

MEMORY LOCATION = 1043 + (40 x HALF WINDOW HEIGHT)

If the "Half Window Height" figure is not a whole number, then convert it to the next highest whole number.

▶ ▶ ▶ ▶ ▶ ▶ ▶

Your window will only have a true centre if the length and width dimensions are both odd numbers.

As mentioned previously, the window will scroll until it reaches the edge of the background, and go no further in that direction. If you want your program to detect when the edge of the background is reached, then PEEKing location 49622 will tell it. If location 49622 holds a zero, this means that no edges have been reached. If it holds a non-zero value, it means that an edge has been reached according to the following: 1 means the top edge, 2 is the bottom edge, 4 is the left edge and 8 is the right edge. These numbers will be added together where appropriate. For example, if you scroll to the top left corner where both the top and left edges are reached, location 49622 will hold a value of five.

Your game may take several days before it is completed, so each time you turn on your computer to start working on it, you have to go through the routine of first LOADing and RUNing ES-DATA, then LOADing your game. When you have finished writing the game, you might like to automate this process so that other users of your game don't have to go through the process of manually LOADing two files. The best way to do this is with a third program which, if you LOAD and RUN it first, will automatically LOAD and RUN the other two files (ES-DATA and your game). You can write this program in BASIC, but because it will be overwritten as soon as ES-DATA is LOADed, you will need to make use of the keyboard buffer. You needn't worry about learning how to do this as the program, SCROLL2, on the disk will do the job. You will only need to change the filenames "ES-DATA" and "YOUR GAME" in lines 10 and 30 to the names that you have chosen for these files.

### Rolling your own

This program will be the file that you will LOAD and RUN, so give it the name you chose for your game, for example "MY GAME". The ES-DATA file will be automatically LOADed next, so rename that something like "MY GAME-DATA". The actual game that you wrote will be the last file to be loaded, so a name like "MY GAME-BASIC" would be suitable.

The scrolling graphics capability provided by Easy Scroller is intended as an aid to your game programming. The success of your game will depend mainly on your own programming skills, and how you use the capabilities of Easy Scroller. However, there's no doubt that scrolling graphics will give your games a special appeal.

# Runaway

Can you escape from home and become a Runaway?

**By Christopher Hester**


Runaway is a text adventure with graphics, created using the Graphics Adventure Creator. The game is based inside your house. Your parents have gone away for the day, leaving the house empty except for you. The object of the game is to escape the house before your parents return – to become a runaway because you've decided that you can't stand your home life anymore.

Your parents, unfortunately, being aware of your feelings, have left the whole house seemingly locked up (or have they?). Can you discover the hidden keys and make full use of the available objects in order to escape in time?

Runaway requires the text input in classic noun/verb form, although adjectives are catered for. Examples would be GET GREY KEY or OPEN SOUTH DOOR. Movement is via the usual NORTH, SOUTH, EAST and


WEST system, and many abbreviations are supported. Apart from shortening the movement commands, X can be used for EXAMINE.

your game position can be saved on to a blank disk with SAVE and LOAD. SCORE will tell you, not surprisingly, your score, TIME gives you the time within the game and QUIT enables you to restart.

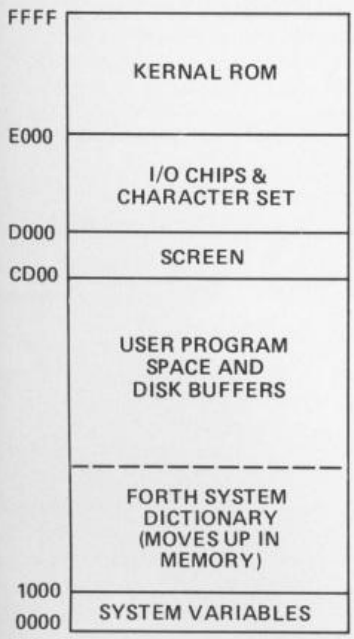
That should be all you need to run away. Go to it!

# CDU FORTH

More CDU FORTH commands from the system featured in last issue

**By R Lincoln**


CDU FORTH Memory Map




**FILL** *i1, i2, i3 ** Fills memory at address *i1* with *i2* number of *i3* bytes.
**FLOG** Replaces the top floating stack number with its natural log.
**FLUSH** Writes all UPDATEd disk buffers to disk.
**FNEGATE** Same as MINUS, but works on floating stack.
**FNUMBER** *addr ** converts ASCII string starting at addr to floating point number on stack.
**FORGET** Deletes a definition.
**FORTH** Name of the primary vocabulary.
**FCOS** Leaves Cosine of top number on floating stack.
**FSIN** Leaves Sine of top number on floating stack.
**FTAN** Leaves Tangent of top number on floating stack.
**HERE** ** o1* Leaves the address of the next available dictionary location.
**HEX** Sets the numeric conversion base to hex.
**I** Used in a DO... LOOP to copy loop index to stack.
**IF** Conditional. Occurs in a colon definition as either IF... THEN or IF... ELSE... THEN
**IMMEDIATE** Mark most recently made definition so that it is executed rather than compiled at compile time.
**IN** Contains byte offset within current input text buffer. A user variable.
**INDEX** *i1, i2 ** Prints first line of each screen over range *i1, i2.*
**INTERPRET** Sequentially executes or compiles text from the input stream.
**KEY** ** o1* Leaves the ASCII value of the next key struck.
**LATEST** ** o1* Leaves the address of the topmost word in the CURRENT vocabulary.
**LEAVE** Forces termination of a DO... LOOP.
**LIST** *i1 ** Displays ASCII text of screen i1 on output device.
**LITERAL** *i1 ** Begins interpretation of screen *i1.*
**LOOP** Ends loop in colon definition DO... LOOP
**+LOOP** Loop with auto-increment. Ends definition DO... +LOOP.
**M/MOD** *i1, i2 * o1, o2* Modulus. Works on double integers to leave. *i1*: dividend, *i2*: divisor, *o1*: remainder, *o2*: quotient.
**MAX** *i1, i2 * o1* Leaves the greater of two numbers.
**MIN** *i1, i2 * o2* Leaves the smaller of two numbers.
**MINUS** *i1, i2 * o2* Leaves the remainder of *i1/i2.* Sign is same as *i1.*
**MOVE** *i1, i2, i3 ** Moves the contents of *i3* memory bytes starting at address *i1* to address *i2.*
**NUMBER** *i1 * o1* Converts string at address *i1* (with preceding count) to signed double integer using current BASE.
**OPEN** *i1, i2, i3 ** Opens a file: *i1*=file number; *i2*=device number; *i3*=secondary address.
**OR** *i1, i2 * o1* Bitwise logical OR.
**OVER** *i1, i2, * i1, i2, i1* Copies second stack value, putting it at the new top.
**PAD** ** o1* Leaves the address of text output buffer.
**POS** ** o1, o2* Returns the cursor position. *o1*=X coord, *o2*=Y coord.
**QUERY** Line input.
**QUIT** End compilation, clearing stack.
**R** Copy top of return stack to computation stack.
**R >** Take top value from return stack and put it on computation stack.
**REPEAT** Used as part of a BEGIN... WHILE... REPEAT colon definition. Forces a branch back to just after the BEGIN.
**ROT** *i1, i2, i3 * i2, i3, i1* Rotates the top three values on the stack.
**RP!** Returns return stack pointer from variable RO.
**RP @** ** o1* Leaves return stack pointer.
**S->D** *i1 * o1* Produces a dobule integer from a single by sign extending.
**SCR** ** o1* Contains screen number most recently referenced by LIST.
**SETNAM** *i1, i2 ** String at address *i1*, length

*i2* becomes current filename.
**SIGN** *i1, i2 * o1* when *i1* is negative puts an minus sign before a converted numeric string contained in the text output buffer. SIGN must be used between # and # .
**SP!** Initialises the stack pointer.
**SP** @ * *o1* Returns address of stack position to the top of the stack.
**SPACE** Sends a space to output device.
**SPACES** *i1 * As SPACE, but sends *i1* spaces.
**STATE** Contains compilation state. Failure to compile is signified by a non-zero value.
**SWAP** Swaps the top two stack entries.
**TAB** *i1, i2 * Moves cursor to position X=*i1*, Y=*i2*.
**THEN** Part of the IF... THEN or IF... ELSE... THEN colon definitions.
**TIB** Contains address of terminal input buffer. A user variable.
**TRAVERSE** *i1, i2 * o1* Used to move across the name field of a variable length name field.
**TYPE** *i1, i2 * Sends *i2* characters from address *i2* to output.
**U*** *i1, i2 * o1* Leaves unsigned double integar product of *i1* and *i2*.
**U/** *i1, i2 * o1, o2* U* but divides. *o1* is remainder, *o2* quotient.
**U<** *i1, i2 * o1* Compares two 16-bit numbers. If *i1*<*i2* then *o2=1*. It is zero otherwise.
**U.** Prints unsigned double integer in current base.
**UNTIL** Part of colon definition BEGIN... UNTIL.
**UPDATE** Marks most recently referenced block as altered.
**VARIABLE** Used to define variables. A defining word.
**VLIST** Lists CONTEXT vocabulary.
**VOCABULARY** Creates a vocabulary definition. A defining word.
**WHILE** Part of colon definition BEGIN... WHILE... REPEAT.
**WORD** *i1 * Reads text characters from input stream, until delimiter i1.
**XOR** *i1, i2 * o1* Bitwise logical XOR.
**!** *i1, i2 * Put *i1* (16-bits) at address *i2*.
**#** *i1 * o1* From *i1* (16-bit) gets the next ASCII character for placing in an output string. Use between < # and # > .
**#>** Terminates numeric output conversion.
**<#** Generates ASCII text in the text output buffer.
**'** * *i1* Leaves the parameter field address of dictionary word *i1*.
**(** Begin comment – requires blank afterwards. Comment is terminated by a close bracket.
***** *i1, i2 * o1* Leaves signed product of two signed numbers.
***/** *i1, i2, i3 * o1* Calculates ratio *i1*i2/i3*.
***/MOD** *i1, i2, i3 * o1, o2* As */ but leaves remainder in *o1*, quotient in *o2*.
**/MOD** *i1, i2 * o1, o2* As / but leaves remainder in *o1*, quotient in *o2*.
**0** *i1 *o1* If *i1*=0 then *o1*=1.
**0=** *i1 * o1* If *i1*=0 then *o1*=1.
**1+** *i1 * o2* Adds 1 to *i1* giving *o1*.
**2+** *i1 * o2* Adds 2 to *i1* giving *o1*.
**2!** *i1, i2, i3 * A 32-bit store command. *i1* and *i2* are 16-bit integers. *i1* is the low byte, *i2* the high. The result is stored at address *i3+2*.
**2** @ *i1 * o1, o2* The opposite of 2!, this gets a 32-bit number from address *i1*. *o1* is the low byte, *02* the high.
**2DUP** *i1, i2 * i1, i2, i1, i2*. Duplicates the first two numbers on the stack.
**:** This is used to start the ubiquitous 'colon definition'. The entry following the colon is used at compile time to set up a dictionary entry.
**;** Terminates a colon definition.
**;S** Stops interpretation of a screen.
**<** *i1, i2 * o1* If *i1* *i2* then *o1*=1.
**<#** The set up command for pictured numeric output.
**+** *i1, i2 * o1* Adds *i1* and *i2*.
**+!** *i1, i2 * o1* Adds *i1* to value at address *i2*.
**+-** *i1, i2 * o3* Gives *i1* the sign of *i2*.
**,** *i1 * Puts *i1* in next available dictionary memory cell.
**-** *i1, i2 * o2* Leaves *i1-i2*.
**--->** Carry on interpretation with next screen.
**-DUP** *i1 * o1 (o2) i1* is only reproduced as *o2* if it is non-zero. Otherwise it is left only once as *o1*.
**FIND** * *o1, o2, o3* Looks through CONTEXT and CURRENT vocabularies for a match for the next text word in the input stream. If the word is found, then its address, length and a non-zero are placed on the stack.
**TRAILING** *i1, i2 * o1, o2* Suppresses trailing blanks on string pointed to by *i1* by altering character count *i2*, and outputting the new count and address.
**.** Prints a signed 16-bit two's complement number.
**."** Compiles an inline string.
**LINE** Line output.
**.R** *i1, i2 * Prints i1 right-aligned in field width *i2*.
**/** *i1, i2 * o1* Divides *i2* into *i1* leaving *o2* (signed divide).
**<BUILDS** Defines a new word with a high-level execution procedure. Used in a colon definition.
**=** *i1, i2 * o1* If *i1*=*i2* then o1=1.
**>** *i1, i2 * o1* If *i1* *i2* then o1=1.
**R** *i1 * Prints value at address *i1* in current base.
**@** *i1 * o2* Leaves the 16-bit number at address i1.
**@** Used in colon definition to open a portion of the code that is executed at compile time, not compiled.
Resume compilation.
**COMPILE** Forces compilation of an immediate definition that would otherwise execute.
**BUFFERS** *i1 * Allocates *i1* buffers for disk use. Each buffer uses 1016 bytes(0<*i1*>50)

# Dungeons & Dragons

D&D is the grandfather of roleplaying games. Gordon Hamlett checks out the computer version.

All roleplaying games owe a considerable debt to Dungeons and Dragons whether they care to acknowledge it or not. What started out as a wargame variant back in the mid seventies, has developed into one of the biggest game phenomena of all time.

As computer RPGs continued to proliferate, it was only going to be a matter of time before the officially licensed product appeared. Written by SSI, *Pool of Radiance* is set in tthe Forgotten Realms campaign and follows the AD&D rules closely. Already, it is the fastest selling game ever in America.

The game is set around the town of Phlan. Once a proud monument on the northern shore of Moonsea, it has recently become overrun by monsters, led by a mysterious character who signs himself 'The Boss'.


*Combat seen from above*


The town council in Phlan has decided to put an end once and for all to this evil menace and as a result, is offering commissions to any group of adventurers willing to hire out their swords.

The game comes complete with a ready-to-go party which is more than adequate to see you through the story. Should you prefer though, you can set up your own group of would-be heroes. Each character has six different attributes – strength, intelligence, wisdom, dexterity, constitution and charisma. All ability scores are in the range 3-18 although there is a definite bias as the computer rolls the ivories in order to give you a better chance to survival. One nice touch is that you can also determine exactly how your character is going to appear on screen, changing colours, faces, bodies and weapons to suit your mood.

Each character must choose a profession – cleric, fighter, magic-user, thief or multi-classed (eg fighter/thief) and a race – human, dwarf, elf etc. Although it is tempting to opt for multi-classed characters in order to gain a wider range of abilities, remember that these characters only progress half as quickly due to experience points having to be shared equally between classes.

Once you have set up your party, it is time to set out into the big, very bad world outside. You start off in the one remaining civilised area of Phlan and your first trip should be to the town council in order to see what jobs are on offer. You do not have to commit yourself to any particular task but should you accomplish one, you can return to the council for your reward.

The commissions are loosely graded in order of difficulty but not totally so. For example, the first job, clearing the slums of monsters, can only be achieved when you have acquired yourself some fireball spells or similar magic due to a group of rather belligerent trolls. These noisome creatures regenerate as you hit them, so fire is the only way to destroy them completely. Although most of the jobs sound really interesting such as spying missions, clearing a

graveyard of undead and discovering a source of river pollution, they quickly degenerate into hack and slash sorties.

While this will no doubt appeal to many players, it is something that all computer RPGs will have to get away from if the format is not to become too stereotyped.

Having said that, combat is very well done in *Pool of Radiance*. Displayed in a raised 3-D perspective, each character can move and attack as they see fit within the constraints of the game. Who hits whom first depends on surprise, dexterity and initiative. If you have just kicked down a locked door, don't be surprised if the creatures on the other side are ready and waiting for you.

Movement depends on what you are carrying at the time. Heavier armour, extra equipment and greed for treasure will all slow you down. If there is no enemy standing next to you, you can fire a missile such as a sling or bow and arrow and it is good tactics to have a couple of archers at the back of your party, especially if they have managed to find some magic bows.


*Characters can be male or female*

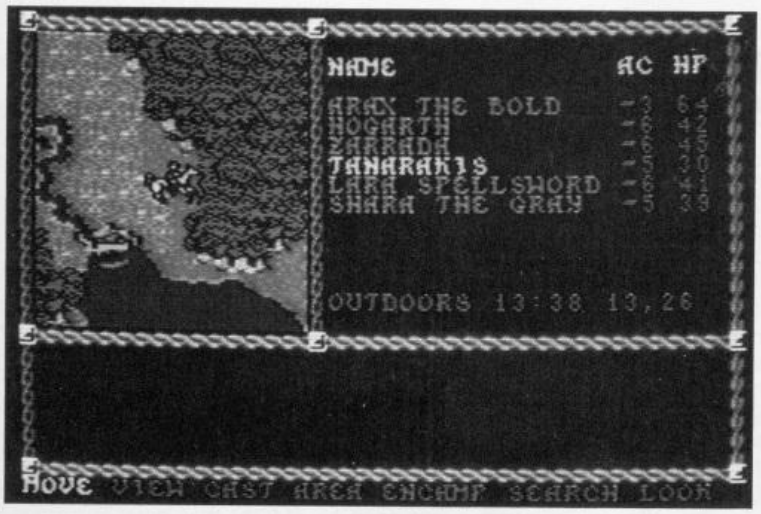
Spells can be cast if they have been previously learnt or you can read them off a scroll but in either case, there is no guarantee that they will work. Offensive spells will prove popular and at low levels, there is no substitute for 'sleep' although make sure that you don't accidentally put one of your own party under – sleeping characters can be killed instantly!

Your opponents in battle are many and various, ranging from the lowly kobold up to the mighty dragon. (I think that the collective noun for kobolds and goblins should be an annoyance given that any number are annoying) Numbers of monsters vary. The first time you encounter a mixed group of over fifty orcs, hobogoblins and bugbears, you will be glad of those brown tunics. Such battles can take up to an hour to complete and your strategy will be put severely to the test. All combat can be put in the hands of the computer, although it does not always select the tactics that you would have chosen so I would recommend strongly that you fight your own battles.


*Buying passage*

Of more interest though are the smaller battles against more powerful opponents. Mummies that paralyse through fear, wraiths that drain your energy levels – one hit and your fourth level fighter suddenly becomes second level! While it is great to cast your first fireball, it is not so much fun when one of the enemy does likewise to you and I still haven't forgiven those driders yet


*Smaller battles can be more exciting*




*Travelling across country*

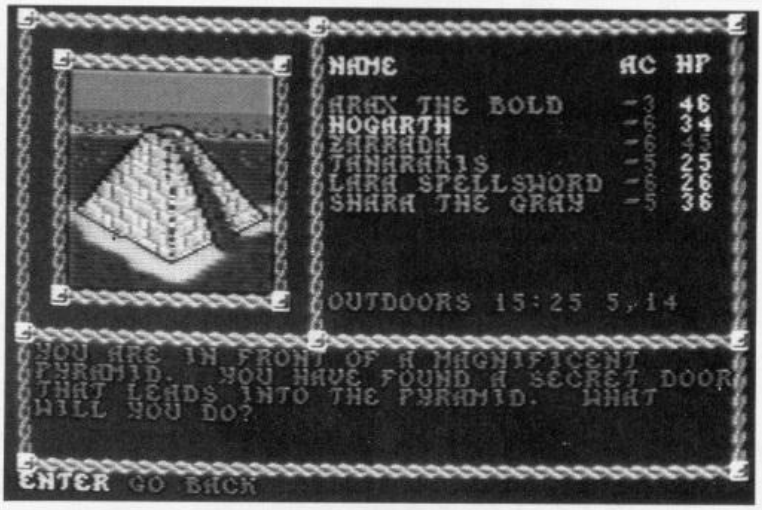
(a cross between a giant spider and drow elf).

All magic spells have to be learned first so it is important to set yourself up a nice safe area where you can rest without being disturbed. It is all too easy to think that sleep and cure light wounds are the only important spells but you discover the need to use a *detect magic* when searching for treasure or a read magic if you should find a scroll. To be perfectly honest, having to lie up and re-learn spells all the time is tedious in the extreme but this is a fault of the original system rather than the game.

All controls are selected from a menu system that works very well in the main although there are a couple that seem unnecessary. Commands can be entered from either keyboard or using a joystick. The accompanying documentation is first class, especially the adventurers' journal which contains details of the information that you discover throughout the course of the game, tavern rumours, proclamations and so forth.

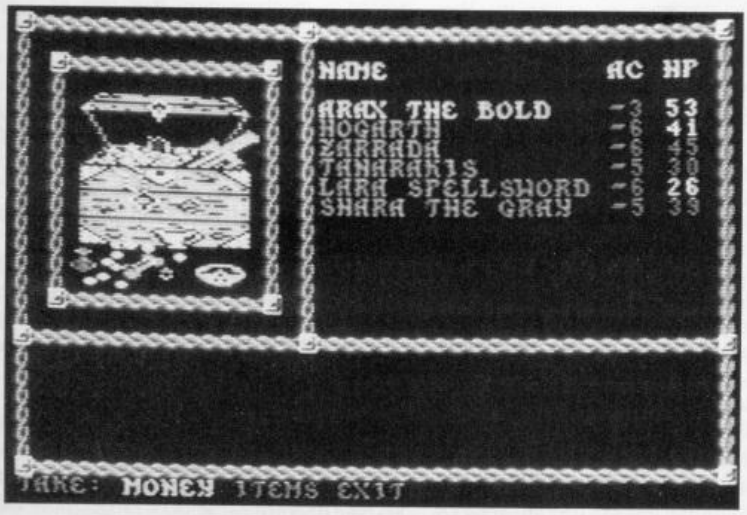
Not everything within the game is rosy though. To start with, disk organisation is diabolical. There are eight disks plus one for saving your games. In order to load in a saved position, you have to access four of them. Similarly, adjacent areas of the game are on different disks rather than grouping them logically so there is a lot of disk swapping involved. And with the speed of Commodore's disks...

Similarly there is possibly too much emphasis on combat. If you are trying to get back to a safe area, there is nothing worse than half a dozen encounters with wandering monsters all taking ten to fifteen minutes each to resolve. The alternative of running to safety after every battle is also tedious in the extreme. Rossini commenting on Wagner's operas said that there are some marvellous moments and some very dull quarters of an hour and to some extent, the same is true here.




*Go home?*

*Just rewards*




Despite all that bickering though, *Pool of Radiance* is definitely one for the collection. Better than most of its rivals, future scenarios can only improve. It took me some time to get into the game but at the time of writing, I have put in more than 100 hours and I still keep going back to it so it must have something going for it. The game is totally faithful to the original and that is just about the best recommendation that I can give it.

# ZMON

Continued from last issue, the C128 monitor with a difference


## Getting back

To switch back and forth between ZMON and BASIC, use 'X' and 'MONITOR'. ZX disables ZMON but does not exit the normal Monitor. When first booted ZMON writes a 'BREAK' vector at $FDFD and alters BASIC's pointers to Bank 1. Apart from during the initial BOOT, 'J 1500' and 'SYS DEC("1500")" have no further affect on these vectors, allowing re-assignments by the user to remain in force. "Warm starting" ZMON using these commands produces no further output to the screen. If you are unsure whether ZMON is currently available, 'ZR', issued from the Monitor, will soon let you know. Use ZX followed by X when you have no further use for the Monitor.

The best place for beginners to place their Z80 programs is in Bank 0 (or Bank 2) between $7DC8 and $FDFC. They are safe there from conflict with ZMON or from being overwritten by BASIC or GRAPHIC commands. There are also plenty of other areas waiting to be found by more experienced users. $1400-$14FF, between the memory-mapped colour table and the start of ZMON, makes a handy pocket for short utility programs. (Bear in mind that ZMON duplicates its own Z80 code ($195C-$1A71) in Bank 1 and requres zero-page $60-$70 for its own purposes.)

Beginners may safely relocate the stack (by changing 'SP') anywhere within $7E00-$FDFO in Banks 0-3 provided their programs don't alter bits 1-6 of the Configuration Register. The Stack will, of course, be located in the same bank that your program executes in. You should always leave at least two free bytes above ZMON's nominal stack-top. ZMON saves a spare copy of its return address there in case your 'ZG' command accidentally encounters a 'RET'.

To execute our final Z80 program we will use 'ZG'. Programs started by 'ZG' should end with 'CALL $19CO' instead of 'RET'. The main advantage is that ZMON's 'PC' will show the address of the instruction following the last instruction executed, rather than repeat the program's starting address. This can be very helpful in debugging programs. RST $38 ("ReStarT at $38) is potentially even more useful as a debugging aid, but beginners exploring the Z80 environment are probably better advised to use 'CALL $19CO' as it works in all configurations. 'RST $38' is safe to use in Banks 0-3 provided the vectors at $FDFD-$FDFF and $39-$3A have not been altered.

If you accidentally 'ZJ' instead of 'ZG', or your program unexpectedly terminates the wrong way, ZMON will sound the bell and display its "STACK ERROR" message.

Although no harm will have been done when this happens, you should heed the warning and do your best no to repeat this (or your program's) mistake. Although the Z80 returned to ZMON that time, it cannot be guaranteed to do so if its stack gets in a mess.

When things seem to be getting out of hand (you don't know whether the stack-pointer is right or not, for example), 'J1500' will always give you a fresh start. Short of that, all that is normally required is to edit ZMON's Z80 Registers display. SP's default setting, $1BAO, is a safe bet for most applications. The Stack Pointer won't normally cause any harm unless – through failure to heed the warning bell – you allow it to increment past $1BFE or decrement below $1B2D.

If your program causes ZMON to lock up in Z80 mode, the only way out is to reset the computer. You may also need to re-boot ZMON from disk or tape if 'J 1500' does not work. You should be prepared for many crashes. Learning to monitor is like learning to ski. To say you have never crashed is to admit you have never given it a decent try.

## Machine-gun data

Our last program uses LDIR, a contraction of "LoaD, Increment and Repeat". Ordinary instructions are to LDIR what muzzle-loaders are to a machine-gun. It is one of a group of eight "macro" instructions the Z80 has available for handling whole blocs of data with a single instruction.

Because they use register 'B' as a counter while BC controls the I/O bus, the IN/OUT instructions in this group do not work on the Commodore 128 as described in many text books. OTIR and OTDR in paricular should not be used.

The most likely candidate on the C128's I/O bus for this type of bulk addressing in Color Memory. Fortunately it may be switched into the Z80's normal address space, bringing it in range of the more powerful LDIR. Using BC as its address counter, LDIR is able to span the entire bloc in a single execution.

Having reassured ourselves that Color Memory may be handled as a bloc if required, we will move on to select a target more worthy

of LDIR – the 8000-byte GRAPHIC Screen at $2000. Being located above $OFFF, we don't need Bank 2 to reach it.

First, we type in the program:

```
ZA 9000 LD A,$32          :Fill-pattern (seed)
ZA 9002 LD HL,$2000       :Addr,Source Bloc
ZA 9005 LD DE,$20000:Addr,Graphic Screen
ZA 9008 LD BC,$1F38       :Final target 8000-8
ZA 900B RRCA              :Rotate seed byte.
ZA 900C LD (DE),A         :Star filling Scrn
ZA 900D INC DE            :until the pattern
ZA 900E CP $32            :begins to repeat,
ZA 9010 JR NZ,$900B       :then, make the
ZA 9012 LDIR              :jump to light-speed
ZA 9014 CALL $19CO        :CALL ZMON
```

Then disassemble it and check our typing:

```
ZD 9000 9016
```

X : and eXit to BASIC.

```
GRAPHIC2,1:MONITOR
```

We have only a five-row window on ZMON now – the GRAPHIC Screen is being displayed above that. We had better fill the bit-map with something to remind ourselves it is there.

```
F 2000 3F3F OF     :Monitor fill using 8502
ZF 2000 3F3F FO    :different pattern using Z80
```

You may have noticed the Z-prefixed Fill is slightly slower than the normal one. That is not a reflection on the Z80's performance, but a result of the way ZMON communicates with it.

To see how fast the Z80 can fill the GRAPHIC Screen:

```
ZG 9000    :  Execute the program.
```

Everything else – even ZMON's register display – seems to be half asleep by comparison. To fully appreciate the magnitude of what has happended, 'AM 2000 3F40' and watch the fill-pattern scroll by.

It is amazing how many Commodore 128 users believe the Z80 can't become involved in 128 mode activities.

They are the ones who don't know about ZMON.

## Inside ZMON

During its initial boot sequences ZMON re-defines BASIC's Bank-1 Variable Storage area as $1C00-$FDFC and performs a BASIC 'CLR'. Zero-page locations $39-$3A subsequently contain $FDFD as a dual-purpose 'Rst $38' vector and BASIC pointer. The actual Z80 'JP' opcode is present at $38 only during 'ZG' and 'ZJ' commands so as not to disturb BASIC string operations. Although ZMON initializes this vector, it does not require it for its own use, allowing the user to re-define the top of BASIC Strings or to re-assign the vector to Mode 1 Interrupts after ZMON has been started. (Subsequent use of 'J 1500' does not affect it).

'RST $38' makes an ideal 'BREAK' vector for Banks 0-3, but should never be used when both Kernal ROM and Z80 ROM are in the same context (as occurs in Bank 15). At $0038, the Z80 ROM says 'JP $FDFD' and at $FDFD the Kernal says 'RST $38', resulting in an endless loop. The runaway stack pointer rubs out ZMON – the Kernal's revenge.

ZMON's own location(s) in Bank 0 are $1500-$1B39 (Main) and $7000-$7DC7 (ZA,ZD). For variable storage it uses zero-page locations $60-$70 and the bloc $OA80-$OABF which is shares with the normal Monitor. ZMON alters the IEXMON vector at $032E and the Kernal ISTOP vector at $0328. It also intercepts Kernal bank-switching routines at $02A2, $02AF and $02BE during Z-prefixed monitor commands.

ZMON's bank-switching code at $195C-$1A71 is duplicated in Bank 1 so that its own operation is independent of the current RAM Configuration. Note however that normal monitor commands (without the Z-prefix) will still crash the system if they attempt to access RAM-1 with Low Common RAM disabled.

ZMON does not protect itself from being overwritten by large BASIC programs, leaving the option of where to locate them open to the user.

ZMON maintains three memory mangment vectors at $1962, $1A38, and $1A5D. For our present application (the published version) they 'do nothing' which is appropriate when first exploring the Z80 environment. Their purpose, however, is to facilitate transformation of the environment as seen by ZMON.

Ideas like giving the Z80 its own zero-page, or creating a common area at the top of memory, are easily implemented by pointing these vectors at your own memory managment code.

The first two vectors are entered with the unmodified configuration byte in A an the return address in HL. The idea is that the first vector's target code should 'drop through' to the second one so that Z80 programs execute in the same environment that ZMON monitors. The third vector is to allow restoration of ZMON's own operating environment following each indirect memory operation.

Note that ZMON does not use the Z80 stack apart from the user-defined stack which is employs during 'ZG' and 'ZJ' commands. On exiting these commands, ZMON reports any non-standard configuration as Bank 15 an disables Z80 interrups (which may have been turned on by the user's program).

ZMON writes a JP instruction at $FFEE-$FFFO (Bank 0) to 'capture' the Z80 at the start of each Z-prefixed command. The original contents of these locations are immediately restored so that their value will be visible to the user who may be working with them. The Z80 will, of course, not be available at that address during Z-prefixed Monitor commands.

# Disk Dungeons

Gordon Hamlett leads you deeper into the roleplaying world.

Welcome to this month's edition of Disk Dungeons. There is actually quite a lot going on, this copy being written at a time somewhere between the end of the PCW show at Earl's Court and the start of the rush to get software released in time for the Christmas rush.

One of my personal highlights at the show was undoubtedly the chance to have a chat with Richard Garriott who is probably better known to you as Lord British, author of and bit player in the Ultima series of roleplaying games. Naturally, the conversation soon got round to how he saw his games against the plethora of other RPGs appearing on the market.

His answer summed up his general philosophy to games. They had to be credible. There must be a whole world that you can believe in, not just a few isolated dungeon levels and this is what he had tried to create in the land of Britannia.


*Lord British – inside his own game*


*Ultima IV – philosphy in action*

It is easy to see this philosophy in action. Take the spells for example. Apart from a couple of instances, they are all different whereas rival games only have a few spells in several guises such as cause a monster small/medium/large amounts of damage. Nor, will you find anomalies in his games such as wizards ninety feet away from you in a ten-foot square room or snakes with legs – examples from two rival products.

He sees a definite need to move away from the hack and slash mentality as seen in games such as *Bard's Tale* and to try and include other features. One example of this is the harpischord in Ultima V. Having put one in for decoration purposes, it seemed pointless not give it some *raison d'etre*. Starting off by just having one that could play, the idea quickly developed into playing a specific tune that would transport you to an otherwise inaccessible area of the game.

Talking of *Ultima V*, what was the real reason for the delay. The story that I had heard (and repeated) was that the dungeon levels were being entirely rewritten. Not true, said Richard. Under time pressure to get the game out for last Christmas, he didn't reach his deadline and so decided to sit down and finish the game off properly by cramming in extra goodies.

Good news for fans of the Ultima series is that *Ultima VI* is currently being written although it is far from completion. Although the game is same size as *Ultima V*, it will have twice the graphic detail (V in turn had twice the detail of IV). Whereas IV and V are on three different scales – wilderness, town and combat, VI will all be on one large scale.

Finally, I asked him where the name Lord British had come from. It appears that he was born in this country although stayed here for only a couple of weeks before crossing the pond. His roots were not forgotten though and he caused great hilarity on his first day at college when he said 'hello' instead of 'hi'. This quickly gave him the nickname of British which he used for characters taken into his PRGs. As the character progressed, so he promoted himself...

Having bemoaned the lack of adventures recently, it comes as no surprise whatever to find three landing on my desk this month. Although three more disparate subjects it would be harder to come up with, it is nevertheless useful to look at them together coming as they do from the old and new Pretenders to the Crown of Britain's number one adventure house.


The two games from Level 9 are *Lancelot* and *Ingrid's Back* whereas Magnetic Scrolls offers us *Corruption*.

As I write this, no less an authority than Burke's Peerage have appeared on the box claiming that they can 'prove beyond reasonable doubt' that the real sight for Camelot is in the west of Scotland linked with the Scottish Kennedys who in turn are probably linked to the Irish Kennedy and hence the American dynasty. I shall have to write my own best seller claiming that President John F Kennedy was really a latter day reincarnation of King Arthur and that the symbolic equation between Excalibur and Cruise Missiles is there for all to see.

Level 9 has adopted a more reasonable approach by going back to the fourteenth century version of the tales – Malory's *Morte D'Arthur* – the source for most latter day material.

Lancelot starts off the story as a young squire, making his way towards Camelot. He must get Arthur to knight him and then set about proving his prowess in a series of quests, some of which are freely borrowed from the exploits of two of the other Knights of the Round Table – Tristram and Gawain.

Two ill-starred love affairs follow, one with the fair maid Elaine which produces Galahad, destined to be the worthiest knight of all and Guenever, his Queen.

Interwoven throughout the story is the Quest for the Holy Grail. Because Lancelot has not been exactly pure in deed, he is not allowed to find the Grail itself although he is granted a vision of it.

The game is easy to get into with many locations to visit and Merlin to help you out if you go wrong. Some of the initial problems seem trivial – it is only after you have played the game for some time that you realise that there might be a bit more to them. A reasonable knowledge of the legends helps and anyone with the slightest interest in the Arthurian stories should enjoy the game.

*Ingrid's Back* is Level 9's second story featuring the well-meaning gnome Ingrid Bottomlow. The first adventure, Gnome Ranger, didn't work particularly well and it is pleasant to report a decided improvement in this second installment.

The evil Jasper Quickbuck has plans for the development of Ingrid's village. The gnomes are not particularly worried about this, being unable to read their eviction orders. Ingrid decides to get up a petition and Part One of the game is concerned with her trying to get the appropriate number of signatures.

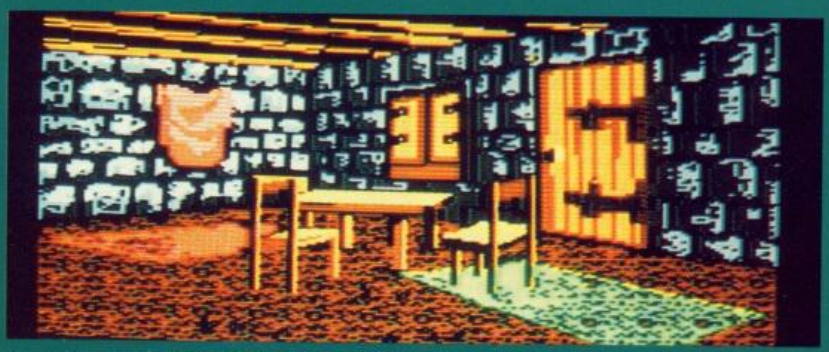
The villagers however have come across Ingrid's schemes before and do their utmost to avoid her. Each of the gnomes live their own lives and this character development is one of the best parts of the game, showing that Level 9 is coming to grips with this part of their game system. As an aside to the game, you can follow the gnomes around as they go about their daily routines.

In the second and third parts of the game, Ingrid has to stop a farm from being bulldozed and then ensure that Jasper gets his due comeuppance. The game has a gentle humour to it. The problems are both original and ingenious but the overall story lacks excitement and the game didn't grab me as Lancelot had done.

The final game of this trio is *Corruption* from Magnetic Scrolls, marketed by Rainbird. This too is a change from their usual style, being serious in nature rather than humorous as their previous games – *The Pawn*, *Guild of Thieves* and *Jinxter* have been.

The player is transported to a world of high finance in the City of London although it soon becomes apparent that the latest FT index is the last thing on your mind.

You have just been offered a partnership in your firm, together with appropriate increase in salary and stock options. The future looks rosy indeed but your entire life quickly collapses around your ears.



You suspect your wife of having an affair with your boss. The Fraud Squad start investigating you for insider dealing. Murder and drugs raise their ugly heads.

You have obviously been set up buty by whom and for what reason? Whoever did it has stitched you up

▶▶▶▶▶

good and proper and nobody believes your pleas of innocence. The only way you can save yourself from prison is to find out exactly what is going on. And that means fighting dirty. Information is power. Blackmail may be too strong a word but certainly, you will have to confront the various characters in the game with whatever evidence you have been able to assemble as you try to garner more clues.

All three games feature advanced, state of the art parsers so you shouldn't have any problems with vocabulary. Graphics are becoming ever more important in adventures as the software companies do their utmost to entice you to try their product. Level 9 are making giant leaps and bounds in this area from their early laughable efforts. The illustrations in *Corruption* were, I felt disappointing, being drab in colours and generally lacklustre compared to their previous games. Couple this with an annoying delay every time you enter a command due to the disk having to be accessed and you are left with a product that is somewhat disappointing in its presentation.

Nevertheless, all three stories are well written and it is good to see that logical, well thought out plots do exist on this side of the Atlantic. If one of the three subject matters appeals to you, I am sure that you won't be disappointed with the game that you have just purchased.

## Death Lord

With the majority of role-playing games on the computer being fantasy-based, it always makes a pleasant change to come across something slightly out of the ordinary. Although *Deathlord* shares many features with these games, the oriental setting is decidely different.

The plot however remains familiar. Once-peaceful kingdom, now subjected to an influx of evil. Grateful Emperor promises gold and land if you can sort out his problems for him. The enemy is Deathlord and as he pours scorn over you and your colleagues for even thinking of chasing after him, he does let slip that you will need to discover seven words and six items before a final encounter can become a reality.

Your first task in the game comes when you try to get to grips with the Japanese terminology. Whereas most people have heard of Samurai and Ninjas, would you know what to do to a Kobito Ansatsusha wielding a tanto? That's a dwarf assassin with a dagger to you and me.

There are eight different races to choose from including ogres and trolls – high on brawn and low on brains – exactly suitable for readers of **** magazine. Attributes consist of the usual strength, constitution, intelligence, dexterity and charisma as well as the more unusual size and power – a measure of your magical aptitude.

It is in the number of classes, though, that the game displays its largest variety with not less than sixteen to choose from assuming your face and characteristics allow it. These range from the untouchable peasants – Kosaku through the Japanese equivalents of thieves, rangers, mercenaries, druids, berserkers and a whole range of assorted spell casters. You can have up to six characters in your party at any given time.

The display is a top down one, highly reminiscent of the Ultima series. Graphic detail is simplistic but the overall effect is a tried and trusted one. As you move about, so only what is in line of sight vision is displayed, in other words, you can't see through trees, walls and mountains. The playing area is large. Sixteen continents to be explored with oceans and deserts to cross and ice caves and trap laden dungeons to negotiate.

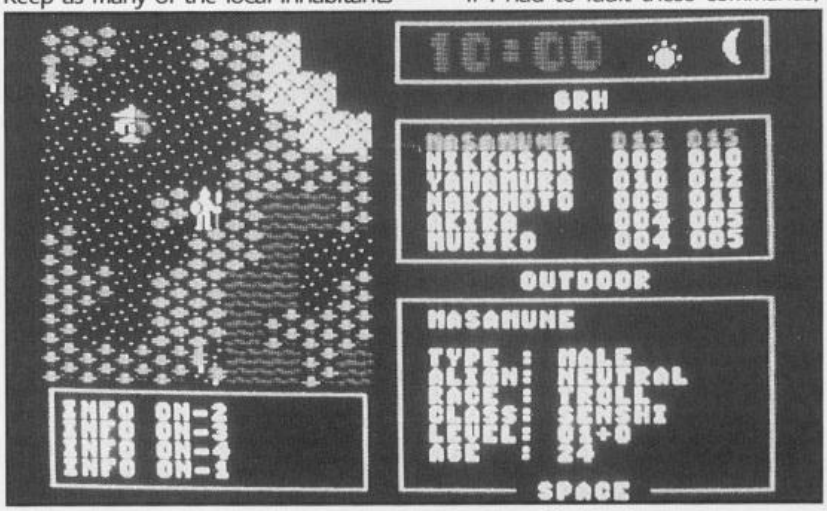
Combat is a necessity of life. Sometimes, you will be able to talk your way out of it, other times it will be weapons and spells to the fore. Automatically attacking everything that gets in your way is not a strategy that is likely to make you task any easier. Keep as many of the local inhabitants on your side as possible! Quite often they have useful information.

Talking to someone via the 'orate' command gives you the chance to buy and sell if you are dealing with a merchant, chat or talk to someone. The difference here is that talk is an attempt to discover some information. Frequently, the response is 'pay up' which gives you the opportunity to part with some of your hard earned cash on the off chance of discovering something useful. You can also inquire about certain subjects providing that a) you know what it is that you want to ask about and b) you are asking the right person.

There are four types of spell that can be cast according to the class of person doing the casting. Shisai are protective and curative in nature such clericals in D and D. Shizen are the druidic spells, as above but more pertinent to the great outdoors. Mahotsukai spells are offensive in nature. A typical example would be taiyohi which opens a gate between the sun and the offending monster and rakes them with mortifying flames. Finally, the Genkai spells which are illusionary in their effect and best used for defensive purposes. One annoying aspect of the game is that you have to type the name of the spell in full when you want to cast it rather than selecting from a menu or using a set of abbreviated mnemonics.

All commands are entered via keystrokes, again a la *Ultima*. One unusual feature is the ability to set up macros. These are a sequence of frequently used commands that can be lumped together to save you having to type the same thing in over and over again.

If I had to fault these commands,



it is in so far as I didn't find them particularly easy to commit to memory. This, when coupled with the unusual terminology really slowed down the initial stages of the game as I found that I had to look everything up all the time.

Comparisons with *Ultima* are inevitable (especially *Ultima III and IV*) and I didn't think that *Deathlord* had anywhere near the same playability although to be fair, not many games have. If you are interested in far eastern culture though, then you should get excellent value for your fifteen pounds.

**Title:** Deathlord
**Supplier:** Electronic Arts, 11/49 Station Road, Langley, Slough, Berks SL3 8YN
**Price:** 14.95

## Mars Saga

More good news if you are one of those types who prefer zapping aliens with lasers rather than fireball spells. *Mars Saga* is the second role-playing game this month to be set on a non fantasy theme (although Deathlord is pseudo-fantasy). As the name suggests, *Mars Saga* is out and out science fiction.

The time is the middle of the twenty-first century and you, Tom Jetland, have managed to get yourself stranded on Mars. Your ship was such a wreck that you had to have it scrapped. Now, with scarcely a credit to your name, you are having to seek out various jobs in order to raise the cash to get you home.

Mars is fairly well-developed as planets go although it is run as a prison colony. This in turn means that many of the characters that you meet have somewhat dubious backgrounds and any jobs that they give you are likely to be of a similar nature.

Your ultimate task though is working for the controller of Primus, the city where you are stranded. He is anxious to find out what has happened in the mining town of Proscenium where all contact has been lost. As you take the job of would-be bounty hunter, you are given a somewhat worrying thought to ponder – you should be more worried about coming back alive than at the pile of credits available for the job.

You start off alone but an announcement in a bar to the effect that all mining installations have been shut down means that there are many more like you who are going to be looking for any work they can get. So you start your recruitment drive on the spot and are pleased to find that only one other person wants to join you. The rest will have to wait until your reputation increases somewhat.

All the characters have several basic attributes – might, stamina, agility etc. unlike most RPGs, these values are fluid throughout the game. Your health is an average of those three values and as it takes a turn for the worse, perhaps at the end of a mugger's switchblade, then some of the other values may fall accordingly.

The main part of character development, though, is in learning skills. The amount that you learn is determined by your experience, ability to pay for the training courses and your education attribute. Thickos can't expect to become Martian Einsteins just through experience. There are plenty of places to learn – universities, computer training centres, personal development colleges and so on but you can't just walk in off the street and say 'hey, teach me all you know about arc guns' The establishments need to know whether you are ready to assimilate the training. Unfortunately, there is no way of knowing when you are experienced enough, you just have to keep going in and asking.

The skills are many and various and highly reminiscent of those used in the excellent Wasteland. Various weapons ranging from your fists through hand guns, missiles, rifles, blades all the way up to pulse lasers. Non-violent skills include medicine, gambling, electrics and programming. Hacking is an essential part of the game so you will need someone proficient in programming to discover tidbits of information for you or maybe just wipe your police record clean!

All this talk of weapons suggests that there will be a fair amount of combat. This is hailed as being one of the best parts of the game, although to date, it is the one aspect that I have found least satisfactory.

The idea is that you issue a series of commands to your characters, move, use an object, flee or whatever. Then, when you have finished, everyone starts moving together to give a 'life like feel'. What you end up with is a mess. Perhaps the instructions are not particularly clear, certainly they could have done with a well worked example to illustrate what they are trying to achieve.


Should you not fancy all this, you can let the computer fight your battles for you although there is no guarantee that it will choose the tactics that you would have selected. The old method of moving your characters one at a time seems to work a lot better especially if you couple it with idea of surprise and reaction time as set in D&D. Maybe it will all improve with familiarity.

The display is a mixture of top down and 3-D and works very well. The 3-D is used to show what you can see in front of you whereas the top down element is used in an excellent auto-mapping routine. Only the areas that you have actually been to are shown on your map so there is no excuse for not visiting vital areas-other authors please take note.

My overall feeling of *Mars Saga* was that it didn't grab me immediately and was going to be a game that I would have to work at if I wanted to get more involved in it.

**Title:** Mars Saga
**Supplier:** Electronic Arts, 11/49 Station Road, Langley, Slough, Berks SL3 8YN
**Price:** 14.95

# High-speed Graphics

Continuing our series designed to add speed to your screens

**Allen Webb**

In many role playing games, the use of a 3D view of a maze is often used to impart atmosphere to the game. Those of you who have played *The Bards Tale* will know what I mean. The purpose of this part of the series is to describe a package of routines which will give an interface with a map generated using my map utility and a 3D view. The map utility, as you will recall, uses an array of screen codes saved in memory. These are then block copied to a window on the screen. The 3D routine will examine such a map and, subject to specified rules, interpret it as a 3D view.

To start with, you must have an array of characters which represents the map you wish to move about. This can be displayed directly using the map routines given last time or simply be used as data for the 3D view. The main requirement is to specify which characters represent walls and which represent passages. The normal space character (character 32) is assumed to represent a passageway. The choice of the wall characters is yours. You may specify 3 characters to represent walls. You may ask why. Obviously you will want to represent a fixed wall. You may also want to have doors or secret passages. You will, however, want to be able to differentiate between them – hence the choice of three characters. I will cover this aspect more later on.

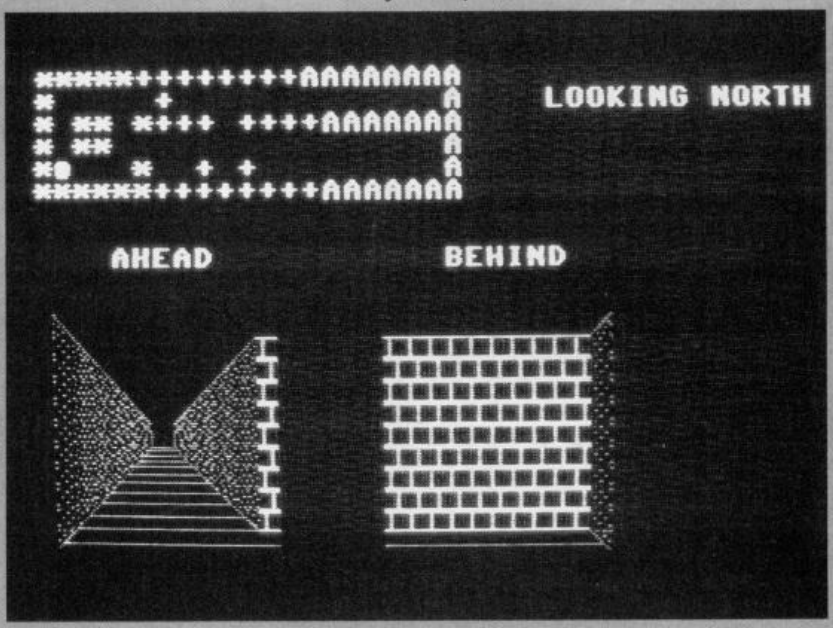
The main routine requires several pieces of information:

*The coordinates of the position of the view on the screen. The display occupies a square 11 characters by 11 characters.

*The map coordinates from which the view is required.

*The direction of view.

Due to the large number of possible views it is important to ensure that the drawing sequence is correct. If it is not, you will get unsightly flickering or other effects when the view is changed rapidly. Bearing this in mind, the routine first examines the map to establish the view required. The map is scanned for three squares in the required direction and the passages identified. Given this information, the view is drawn in a sequence such that unsightly effects are minimised. Even this effect was unsatisfactory and the final routine uses a buffered output. The view is drawn in a buffer and then drawn direct to this screen. This results in an absolutely flicker-free display.




The code occupies the area from $OD80 (3456) to $1663 (5731). The area from $CD00 to $CFFF (52480 – 53247) is used for the picture buffer. There are two main routines:

**SETUP.**

This has the syntax:

SYS 3459, MAPADD, WIDTH W1, W2, W3, C1, C2, C3, C4, C5, C6, C7 where:

MAPADD is the start address of the map data

WIDTH is the width of the map

W1,W2,W3 are the characters used to represent walls

C1..C7 are the colours for different parts of the walls

In order to give you greater flexibility, you can specify the colours of various parts of the 3D view. Since the system must work in both multi-colour and high-resolution modes the walls of the corridor and the floor are set to the same colour. You can, however, specify the colours of the walls you face. Specifically, the parameters in the SETUP routine have the following effects:

C1 – corridor colour

C2 – farmost wall

C3 – middle position wall across the corridor

C4 – nearest wall across the corridor

C5 – nearest side corridor on left
C6 – middle side corridors (both left and right)
C7 – nearest side corridor on right

This option has a number of possible uses, for example:
* Use different colours for different levels or parts of the maze.
* Use darker colours as walls are further away to give a better 3D effect (the demo uses this effect).
* Use progressively dark colours to simulate a torch burning out.

**LOOK**
This has the syntax:

SYS 3456, MAPX, MAPY, SCREENX, SCREENY, DIR

Where:

MAPX,MAPY are the coordinates in the map
SCREENX,SCREENY are the coordinates of the top left corner of the 3D view.

DIR specifies the direction of the view:

0 = NORTH
1 = EAST
2 = SOUTH
3 = WEST

The demo shows a simple application. The map is drawn on the screen and its start address is therefore 1024. Similarly, since it is drawn with the normal line spacing, the map's width must be defined as 40 (the normal screen width). The demo uses characters 42, 43 and 1 as wall characters and shows the view both ahead and behind. The N,E,W and S keys are used to select the direction of view and F is used to move forward. As you move, the map shows your new position. Since no wall detection is used, however, you can walk through the walls. Since the demo was intended to operate without the raster environment present, line 5 was added.

If you want to use it with the raster environment active delete line 5 and activate the bottom three zones with ME = 26. The routines use a block of reverse field characters (numbers 128 and 189 inclusive) to draw the view. Two character sets with these characters altered to give two different 3D displays are provided on the disk (these occupy the slot from $2800-$2FFF). The number of characters used is in excess of the minimum needed since I wanted to give the ability to draw reasonably elaborate views. (If you try 3D CHARS # 1 you'll get the idea) Using these entry points you can display the individual drawing functions. Since the address initiation routine is not accessed by these routines you will see two blocks of data on the screen. The block nearest to the top left corner is the character pattern. The other is the colour data. This is not a problem *provided* that you type in the following command before you call the entry points:

SYS 3456,0,0,0,0,1

As a final aid, the file called "DATA BLOCKS" on the disk holds the portion

of the source code which sets up the picture data. The values are the POKE values for each character of the display. The table CORR, for example, comprises of 11 rows of 11 characters which, if poked onto the screen would draw the corridor. Got the idea? The furthermost and middle walls have no tables since they comprise of only single characters (205 and repectively).

Since the idea of this series is to provide a set of basic tools, it is up to you to work out ways of using them. It is, however, a simple matter to come up with clever tricks. It would be a simple matter, for example, to display additional information. Imagine that you want to display an insurmountable hole in the floor. You could represent this on the map as any character not recognised as a wall. The map routine could be used to "look" ahead and detect it's presence. You could then arrange the logic to display a sprite depicting the hole and to prevent you crossing it until appropriate measures to cross it. If you adopt this sort of approach, you will be surprised what complexities and tricks you can come up with.

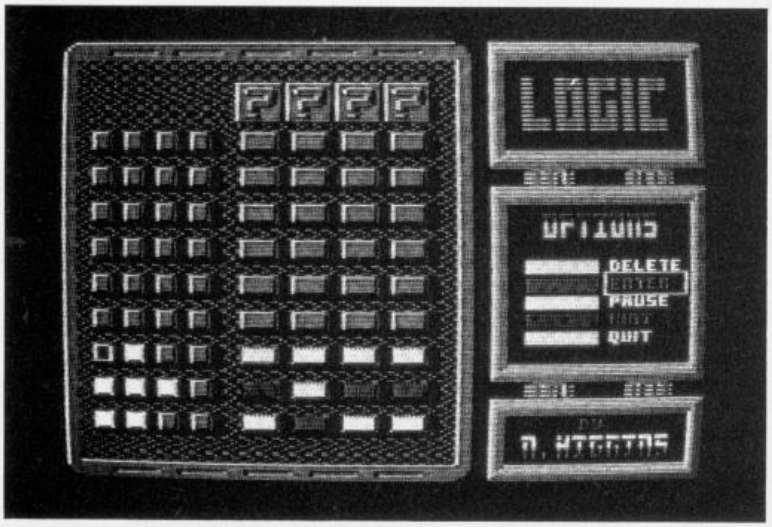
**Table 1**

| Entry point | Function | Data Block |
|---|---|---|
| 3462 | Draws a basic corridor without side exits | CORR |
| 3465 | Draws furthermost wall across corridor | |
| 3468 | Draws intermediate wall acros corridor | |
| 3471 | Draws nearest wall across corridor | NWALL |
| 3474 | Draws nearest left exit | NLEFT |
| 3477 | Draws middle left exit | MLEFT |
| 3480 | Draws middle right exit | MRIGHT |
| 3483 | Draws furthermost left exit | FLEFT |
| 3486 | Draws furthermost right turning | FRIGHT |
| 3489 | Draws nearest right turning | NRIGHT |
| 3492 | Draws near and middle left exits | NMLEFT |
| 3495 | Draws near and middle right exits | NMRIGHT |
| 3498 | Draws near, middle and far left exits | NMFLEFT |
| 3501 | Draws near, middle and far right exits | NMFRIGHT |

I must apologise for the absence of the map designer promised last time. It is essentially complete but due to the pressures of other needs, I haven't fully refined it. I'll make every effort to have it ready for the next issue.

That's all for now, next time I will present a system for the easy handling of sprites.

Obviously you will want to design your own characters. This takes a little care. There is insufficient space here to indicate which characters show which display – you will need to do this. One way is to run the demo with line 5 removed. This will show the composite view in normal characters. To allow you to examine each drawing routine, I have included a jump table in the code. The entry points are given in Table 1.




# Logic

You don't have to be Mr Spock to solve this challenge to your intellect. It could help though...

**By Neil Higgins**

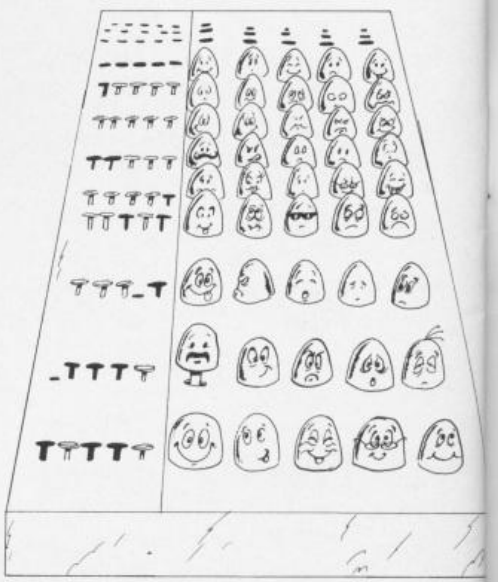
Logic is a game that will need careful thought. The computer will present you with an array of five pegs, each of which can be any one of five colours: red, green, yellow, blue and purple. The problem is that you don't know what colours are used or where they go.

Don't despair, because the program will give you a number of tries. It will tell you each time how many pegs you have got of the right colour in the right place by displaying one to four black blocks, plus white blocks to show how many are the right colour but are in the wrong place.

The menu allows you a number of options when playing Logic. Besides the five colour bars which allow you to place pegs, you can delete the last peg placed by choosing delete, or confirm your choice of pegs by entering Enter. The joystick is used to make all choices.

## Loading the program

To load Logic outside the menu, enter LOAD "LOGIC",8 and RUN.



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